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Systems Reference Library

Catalog of Programs for IBM System/360

Models 25 and above

(January 1971)

This catalog contains a complete listing of all Program Products and Type I, II, III, IV, and prior use programs for the IBM System/360 Models 25 and above, available from the Program Information Department, 40 Saw Mill River Road, Hawthorne, New York 10532.

Instructions for ordering Program Products can be obtained from your local IBM Branch Office. Instructions for ordering Type I, II, III, IV and prior use programs are contained in the section of the Introduction entitled, "Completion of the IBM Program Order Form".

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Ninth Edition (December 1970)

Copies of this and other IBM publications can be obtained through IBM branch offices.

A form is provided at the back of this publication for readers' comments. If this form has been removed, address comments to: IBM, Program Information Department, 40 Saw Mill River Road, Hawthorne, New York 10532

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INTRODUCTION

The only authorized IBM agency in the U.S. for the distribution of Program Products, Type I, II, III, IV and Prior Use programs, to be defined below, is the IBM Program Information Department (PID), 40 Saw Mill River Road, Hawthorne, New York.

PROGRAMS AVAILABLE FROM PID

IBM makes available a wide variety of programs for IBM systems. This catalog contains a list of available programs categorized as Program Products, Type I, II, III, IV and Prior Use programs

PROGRAM PRODUCTS

Program Products perform an end-use function for the user and usually interface with and rely upon a currently available control program. Program Products contain logic directly related to the user's data, and are directly usable or adaptable to meet his specific requirements.

Program Products are licensed to customers under the License Agreement for IBM Program Products (Z120-2065). Under the terms and conditions of the License Agreement, IBM grants nontransferable and nonexclusive licenses to use the Program Products including basic material and related optional materials.

Further information regarding Program Products and their ordering instructions can be obtained by contacting your IBM Branch Office.

Program Product Identification

Each Program Product is assigned a seven-character identification code for ordering purposes. The first two digits (57) identify it as a specific program. The next two digits identify the system under which it will run. The next two characters are a functional mnemonic describing the program class. The last character is an identifier which distinguishes a Program Product from others in its class.

Functional Programs

AS Assembler: A program which prepares an object language program by producing absolute or relocatable machine code from a source program of statements containing symbolic operation codes and symbolic operands.

CB COBOL Compiler: COBOL (Common Business Oriented Language) is a language primarily for commercial data processing. It is the result of work by the Conference on Data System Language (CODASYL), a voluntary cooperative effort by a number of users and manufacturers of data processing equipment.

CP Conversational Prompter: Program that conversationally accepts terminal user commands, dynamically allocates work files and invokes appropriate compiler, if required.

CV Conversion: Programs which facilitate the running of programs written for one type of machine on another type or configuration.

DC Documentor: A program which performs some or all of the functions of producing, maintaining, controlling, and distributing text, tabular, and graph information, including flowcharts.

FO FORTRAN Compiler: FORTRAN (FORmula TRANslation) closely resembles the language of mathematics. FORTRAN permits people who are not trained programmers to prepare programs for a computer. FORTRAN is especially useful in scientific and technical fields where most problems are expressed in mathematical form.

LM Library Material: Supplementary programming developed for inclusion in a library (an organized collection of standard checked-out routines). An example is a mathematical function subroutine.

MI Miscellaneous:

PL PL/1 Compiler: A program which compiles programs written in PL/1 language.

PT Program Test: A program which facilitates the testing and debugging of programs.

RG Report Generator and Report Program Generator: A program which constructs a report or report-writing program in accordance with input specifications of the data file and of the desired report.

RC Remote Computing: Programs which provide access to a computer from multiple remote terminals for immediate or batch processing of individual tasks.

SM Sort/Merge

SU Simulator: A program which permits the running on the machine of a program expressed in the machine language of the simulated machine.

UT Utility: A program or set of programs which assist in the operation of a computer; e.g., storage clearing, intermediate data transmission, simple loaders, dump programs, file

organization routines, etc.

APPLICATION PROGRAMS

Business and Management Services
- B1 Service Bureaus
- B2 Consultants

Distribution
- D1 Department Stores and Apparel
- D2 Food and Beverage
- D3 Drugs, Soaps, and Cosmetics
- D4 Hard Goods
- D5 Agribusiness

Finance
- F1 Banks
- F3 Brokerage and Investment
- F4 Savings and Savings and Loan
- F5 All other Financial

Insurance
- N1 Life and Accident and Health
- N2 Property and Liability

Manufacturing
- M1 Aerospace
- M2 Motor Vehicles
- M3 Fabrication and Assembly - Equipment Systems
- M4 Fabrication and Assembly - Other Equipment, Small Aircraft, Rail
- M5 Fabricators
- M6 Construction, Contractors, Arch. Engineers, Ships

Education
- E1 Colleges and Universities
- E2 Junior and Community Colleges
- E3 Elementary and Secondary Schools
- E4 Vocational Schools - Profit-making
- E5 Education Research Services not elsewhere classified
- E6 State Boards of Education

Medical
- H1 Medical and Health Care

Cross-Industry
- XA Statistical Applications
- XC Process Control
- XM Mathematic Applications
- XN Numerical Control Applications
- XP Critical Path Scheduling
- XR Information Retrieval
- XS Simulators
- XT Operations Research
- XX Other

Media
- K1 Media

Process
- P1 Primary Metals
- P2 Forest Products
- P3 Rubber and Plastics
- P4 Textiles
- P5 Glass
- P6 Paint and other Non-metalic Mineral Products
- P7 Petroleum
- P8 Chemicals

Public Utilities
- U1 Utilities
- U2 Communications

Transportation
- T1 Airlines
- T2 Motor Freight
- T3 Railroads
- T4 All other Transportation

DP Leasing Companies
- W1 DP Leasing Companies

DP Equipment Manufacturers
- L1 DP Equipment Manufacturers
- L2 Service Bureau Corporation

OEM
- Z1 Sales of DP equipment to Original Equipment Manufacturers for subsequent resale with their own equipment

State and Local Government
- G1 State Government
- G2 Local Government

Federal
- Y1 Army
- Y2 Navy
- Y3 Air Force
- Y4 Joint Defense
- Y5 Civilian

Engineering
- EC Civil Engineering
- EE Electrical Engineering
- EH Chemical Engineering
- EM Mechanical Engineering
- EN Nuclear Codes
- ET Optics
- EX Other

Exploratory
- EP Mathematics and Applications

TYPE I AND II PROGRAMS

Type I and II programs are programs which have been subjected to formal testing. All Type I and II programs have been assigned a Service Classification. For information concerning Service Classifications, contact your IBM Branch Office. Most Type I and all Type II programs were available for delivery from the Program Information Department prior to June 23, 1969.

TYPE III AND IV PROGRAMS

Type III programs have been submitted by one or more IBM employees. They are programs of general interest submitted for unrestricted distribution. They have met a basic set of programming and documentation

standards but are not program tested in any formal fashion by the IBM Corporation. The user is expected to make the final evaluation as to the usefulness in his own environment. These programs were available for delivery from the Program Information department prior to June 23, 1969.

IBM MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AS TO THE DOCUMENTATION, FUNCTION OR PERFORMANCE OF THESE PROGRAMS.

Systems Engineering Service (charge basis) is available from your IBM Branch Office to assist you with the installation, modification or any technical assistance required for use of this program.

Type IV programs are those contributed for unrestricted distribution by one or more authors of which at least one is an employee of an IBM customer. They are made available by IBM essentially in the author's original form, but conform to published Type IV standards. IBM exercises no control over the technical content of the documentation but merely assures that the quality of reproduction is satisfactory. Type IV programs have not been tested by IBM. The user is expected to make the final evaluation as to their usefulness in his own environment.

IBM MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AS TO THE DOCUMENTATION, FUNCTION OR PERFORMANCE OF THESE PROGRAMS.

TYPE III PROGRAMS WITH SERVICE A CLASSIFICATION

Type III programs which were given Service A Classification, perform functions which may be fundamental to the operation and maintainance of the user's system. These programs have not been subjected to formal test by IBM.

Until reclassified, IBM will provide for these Type III programs the following: (a) Central Programming Service including design error correction and automatic distribution of corrections; (b) Field Engineering Programming Service including design error verification, Authorized Programming Analysis Report (APAR) documentation and submission, and application of Program Temporary Fixes or development of an emergency by-pass when required.

IBM does not guarantee service results or represent or warrant that all errors will be corrected. The user is expected to make the final evaluation as to the usefulness of these programs in his own environment.

THE FOREGOING IS IN LIEU OF ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

PRIOR USE PROGRAMS

There are a limited number of programs that were developed prior to June 23, 1969 which were in the possession of and were being used by customers without restriction, but were not included in the Type III or IV libraries. These programs have been designated Prior Use Programs and are being made available through the Program Information Department (PID).

Prior Use Programs have not been developed, or tested in any formal fashion by the IBM Corporation, and, therefore, are available only on an "as is" basis without charge. It is the customer's responsibility to make the final evaluation as to the usefulness of the program in his own data processing and business environment.

IBM MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AS TO THE DOCUMENTATION, FUNCTION OR PERFORMANCE OF THESE PROGRAMS.

Prior use programs are classified as follows:

360K - System/360 Model 20
360L - System/360 Models 25 and above
1131 - 1130 Computing System
1801 - 1800 Data Acquisition and Control System
1402 - Data Processing System

PROGRAM UPDATE SERVICE

Users ordering the basic program packages for Type I and II programs from PID become "users of record". A "profile" is established for each user of record, containing the users customer number, name and address and other "ship-to" information, and an entry for each Type I and II basic program package ordered. Users of record are provided with the PID Program Update Service based on the entries in these profiles, with the exception of programs having a Program Service Classification of C.

The Program Update Service provides users of record with automatic program maintenance (corrections and/or supplements to the basic program material) for Type I and Type II programs. The Program Update Service also provides users of record with

announcement material and ordering information for that class of program maintenance (e.g., new version, releases, etc.) which must be ordered from PID.

When an orderable replacement package (total or partial) of a Type I or II program is announced, it is not always essential to order it to remain eligible for Program Update Service.

There are situations, however, when continued Program Update Service would not be meaningful unless the replacement package is ordered. In these situations, failure to order results in cancellation of further Program Update Service for this program.

A statement specifying the need to order will always be included in the announcement notification which goes to users of record. Program Update Service is not provided for the optional program material for Type I and II programs or for Type III and IV programs.

IBM CATALOGS OF PROGRAMS

Abstracts and ordering instructions for Program Products and all Types I, II, III, IV and Prior Use programs available from PID are found in the IBM Catalogs of Programs and their Supplements, published periodically by PID. These Catalogs are available from the Mechanicsburg Distribution Center as follows:

SYSTEM	CATALOG FORM NUMBER	SUPPLEMENT FORM NUMBER
1240/1401/1420 1440/1450/1460	GC20-1601	GN20-0013
700 Series, 1410, 7000 Series	GC20-1602	GN20-0014
1620/1710	GC20-1603	GN20-0015
System/360 Models 25 and above	GC20-1619	GN20-0030
1130/1800	GC20-1630	GN20-0031
System/360 Model 20	GC20-1691	GN20-1852

PID ORDER PROCESSING TURN-AROUND TIMES

The normal elapsed time which can be anticipated from the time the program order is shipped to PID till the time the order is received may be calculated from the following table:

ACTION	TIME IN DAYS
Order sent to PID	Average - 4 calendar days in transit
Order processed at PID	Maximum - 8 working days at PID
Order sent from PID	Maximum - 4 calendar days in transit

Thus, a three-week cycle should be planned for when ordering programs from PID.

SHIPPING METHODS

PID uses three methods to ship program packages, depending on destination, weight and urgency. This information may be worthwhile to users who send magnetic volumes to PID.

1. United Parcel Service (air and land) is used whenever possible.
2. U.S. Mail is used for destinations beyond United Parcel territories. Fourth Class Special Delivery is the level of service chosen because it provides service comparable to First Class (4 days maximum to any location in the continental United States) at a much lower rate. Special Handling service, it should be noted, is not the same as Special Delivery service, and is not as fast. PID insures Fourth Class Special Delivery shipments to provide a means for tracing shipments. A signature at the destination is a requirement for insured packages.
3. Air Freight service is used for expedited shipments. To metropolitan centers, overnight delivery can usually be expected. Two-day delivery to locations more than 50 miles from a major airport is normal.

COMPLETION OF THE IBM PROGRAM ORDER FORM

INTRODUCTION

The IBM Program Order Form (120-1957) is to be employed for all orders submitted to PID for Type I, II, III, IV and Prior Use programs and for communications with PID relative to the establishment, modification and deletion of PID user profiles. This is the ONLY form to be used for these purposes.

The IBM Program Order Form is a 3-copy form. Copy 3 is retained by the user. Copies 1 and 2 should be forwarded to the IBM Branch Office. After completing Section 5 (see below), the Branch should forward Copy 1 to PID and retain Copy 2 for reference purposes.

IBM PROGRAM ORDER FORM CONTAINS 5 SECTIONS:

- Section 1, Program Package Identification, is used to describe the program material required.

- Section 2, Customer and Order Identification, MUST ALWAYS BE COMPLETED.

- Section 3, User Volume Information, is to be completed when the order requires the submission of user volumes.

- Section 4, User Registration, is completed to register a new PID user, or to modify or delete a user registration.

- Section 5, For IBM Use, MUST ALWAYS BE COMPLETED, by an IBM representative.

Instructions for the completion of each section are given below. Refer to the sample form (Figure 1) presented at the end of this discussion.

SECTION 1 PROGRAM PACKAGE IDENTIFICATION

This section is used to describe the program packages being ordered. For ordering purposes, a distinction is necessary between a "Single Component" program and a "Multiple Component" program.

The terms Single Component program and Multiple Component program are not functional descriptors. They are a convenient mechanism to facilitate the order.

A Single Component program is fully and completely specified (in columns 1-24) on one line of the PID Order Form (Section 1).

A Multiple Component program is specified by a system line and one or more component lines. The component lines indicate the desired items within the system specified by the system line.

Any combination of single component programs and multiple component programs may be ordered at one time. A total of 25 ordering lines have been provided on the order form. If more than 25 lines are required, the order may be continued on a second form and then a third, etc. The only restriction is that an order for a multiple component program may not be interrupted by an element which is not a member of that multiple component program.

COLUMN 1 BASIC OR OPTIONAL MATERIAL

The requester specifies, in Column 1, whether the basic or optional program package is required. If both the basic and the optional program packages are required, they must be described separately, on separate lines of the form. The contents of these program packages are described in the abstracts in this manual.

Single Component Program	Enter B or O
Multiple Component Program System Line	Enter B or O

COLUMN 2 MACHINE READABLE

The requester specifies, in Column 2, whether or not he wishes the machine readable portion of the program package.

Single Component Program	Enter Y or N
Multiple Component Program System Line	Enter Y or N

COLUMN 3 DOCUMENTATION

The requester specifies, in Column 3, whether or not he wishes the documentation portion of the program package. PID will send one copy of the basic documentation associated with each Type I and II program ordered, if the documentation is requested. Requests for ONLY the documentation for Type I and II programs, when the machine readable material is not ordered, should be sent to the Mechanicsburg Distribution Center by the IBM Branch Office (use Publication Requisition #M02-0618-4). Also, requests for multiple copies of documentation for Type I and II programs should be requested through the IBM Branch Office.

PID will honor "documentation only" requests for Type III and IV programs and also requests for multiple copies for Type III and IV program documentation, up to 3 copies. If more than 3 copies are required, the user may reproduce copies locally (provided this material is not copyrighted).

Single Component Program	Enter 0 or 1 for Type I and II programs Enter 0, 1, 2 or 3 for Type III and IV programs
Multiple Component Program System Line	Enter 0 or 1.

COLUMNS 4-13 PROGRAM NUMBER

The exact program number, as specified in the ORDERING INFORMATION portion of the Catalog of Programs abstract should be entered in this field (Reminder: A multiple component program is specified by a system line and a series of component lines).

Single Component Program	Enter the program number (e.g. 360AFB15X) in Columns 4-12 or Columns 4-13,as

	length requires. Omit all special characters such as decimal points or hyphens.
Multiple Component Program	
System Line	Enter the system number (e.g. 360N) in Columns 4-7. Blank in columns 8-13.
Component Line(s)	Blank in Columns 4-7. Enter the component numbers (e.g., AS465, CB452) one per line in Columns 8-12, or Columns 8-13, as the length requires. Omit all special characters such as decimal points or hyphens.

COLUMNS 15-20 PROGRAM NUMBER EXTENSION

The Program Number Extension is used in conjunction with the Program Number to completely and uniquely identify orderable Types I, II, III and IV programs from PID. Program number extensions pertinent to a given program number are described in the Ordering Information portion of the Catalog of Program abstract for that program. Whenever a program number requires a program number extension, IT MUST BE ENTERED in Columns 15-20.

Single Component Program	Enter as specified in the Catalog of Programs (left justify).
Multiple Component Program	
System Line	Enter as specified in the Catalog of Programs (left justify).

COLUMN 14 ACTION CODE (Type I and II BASIC PROGRAM PACKAGES ONLY)

Column 14 provides the user with the means to maintain his PID profile for Type I and II programs in order to make most effective use of the Program Update Service (see Basic Information). There are 3 specific actions requiring an entry in Column 14. COLUMN 14 SHOULD BE LEFT BLANK IN ALL OTHER CASES. These three actions are:

1. RE-ORDER

Users of record receive announcements of the availability of total system replacements for both single and multiple component programs automatically from PID. To simplify the re-order process for a multiple component program, users may obtain an announced total replacement as follows:

Multiple Component Program	
System Line	Enter R in Column 14.

Users may also simultaneously update their profile for multiple component programs and re-order as follows:

Multiple Component Program	
System Line	Enter R in Column 14.
Component Line(s)	Enter A in Column 14 to add a component to the profile. Enter D in Column 14 to delete a component from the profile.

The system being re-ordered must have its System Number entered in Columns 4-7 of the system line. Any applicable program number extension which is identified in the announcement material must be entered in Columns 15-20. The remainder of Columns 1-24 must also be completed as applicable. Components being added or deleted must be entered in Columns 8-13 of the component lines. The remainder of the component lines is left blank.

The re-order action does not apply to single component programs.

2. ORDER AN ANNOUNCED MAINTENANCE PACKAGE

Users of record receive announcements of the availability of orderable maintenance packages (Types I or II programs) for both single and multiple component programs automatically from PID.

Users wishing to order an announced orderable Types I or II programs maintenance package may do so as follows:

Single Component Program	Enter M in Column 14
Multiple Component Program	
System Line	Enter M in Column 14

Users may also simultaneously update their profile for a multiple component program and order an announced maintenance package, as follows:

Multiple Component Program	
System Line	Enter M in Column 14
Component Line(s)	Enter A in Column 14 to add a component to the profile. Enter D in Column 14 to delete a component from the profile.

The program for which maintenance is being ordered must have its number entered in Columns 4-13 (for a single component program) or Columns 4-7 (for a multiple component program). Any applicable program number extension which is identified in the announcement material must be entered in Columns 15-20. The remainder of Columns 1-24 must also be completed as applicable. Components being added or deleted must be entered in Columns 8-13 of the component lines. The remainder of the component lines is left blank.

3. DELETE A TYPE I OR II PROGRAM FROM THE USER PROFILE

Through the Program Update Service, PID makes extensive distributions of machine readable material and documentation to all users of record of all Type I and II basic programs. It is essential that the PID profiles be kept up to date to facilitate the distribution of this material to active users as well as to avoid the distribution of this material to installations no longer using previously ordered Type I and II programs.

A Type I or II program previously ordered, which is no longer being used, may be deleted from the PID profile as follows:

Single Component Program	Enter D in Column 14
Multiple Component Program	
System Line	Enter D in Column 14

The program number and any applicable program number extension must be entered in Columns 4-13 (for a single component program) or Columns 4-7 (for a multiple component program) and Columns 15-20 respectively. No other entries in Columns 1-24 are required. No component line entries should be made.

COLUMNS 21-22 DISTRIBUTION MEDIUM CODE (See Table Below)

The media on which each Types I, II, III and IV program is available from PID and the codes to be used, in Columns 21-22, to specify the desired media are identified in the Catalog of Programs abstract for each program.

Single Component Program	Enter the selected medium code.
Multiple Component Program	
System Line	Enter the selected medium code.

MEDIUM CODE TABLE

TYPE	DESCRIPTION	CODE
DTR*	Medium defined by PID user profile	00
PT	8 channel paper tape	05
CARDS	80 column punched cards	15
7/556	Magnetic tape recorded at 7 track, 556 cpi.	22
7/800	Magnetic tape recorded at 7 track, 800 cpi.	24
7DC/800	Magnetic tape recorded at 7 track, 800 cpi.;Data Convert feature required.	26
9/800	Magnetic tape recorded at 9 track, 800 bpi.	28
9/1600	Magnetic tape recorded at 9 track, 1600 bpi.	29
1316	1316 Disk Pack	52
2315	2315 Disk Cartridge	58
2316	2316 Disk Cartridge	57

NOTE 1: DTR*
Card programs will be distributed on DTR's (Distribution Tape Reels) to card users with magnetic tape capability as indicated on the PID user profile (See Section 4). These programs will be distributed in card form to users with no magnetic tape capability. Whenever possible, multiple card programs ordered together will be stacked on one or more DTR's. A retriever will be placed at the beginning of each DTR, enabling the user to selectively punch out the programs stacked on the DTR.
Card programs which will be volume shared as described above are identified by DTR* in the ordering information portion of the Catalog of Programs abstracts. The user may establish or modify the profile entry describing his magnetic tape capability through the use of Section 4 of the Program Order Form.

NOTE 2: Types I, II, III, IV and Prior Use program orders require the user to specify a medium code. However, in the absence of a medium code, a default option is exercised by PID under the following circumstances.

- All distribution media for the program package in question (Basic or Optional) must be

magnetic tape.

- User volume requirements for the program package in question (Basic or Optional) must be the same for all tape types.
- The default medium must be one of the recording densities available.

The default options are:

- For programs available on 7/556 cpi and 7/800 cpi, 7/800 cpi will be supplied.
- For programs available on 7DC/800 cpi, 9/800 bpi, or 9/1600 bpi, 9/800 bpi will be supplied.

COLUMNS 23-24 USER VOLUMES REQUIRED

When the programs ordered requires the submission of user volumes (2400' magnetic tape reels and/or disk devices) number of user volumes for each program, as specified in the Catalog of Programs abstract, is entered in Columns 23-24 and Section 3 of the order form is to be completed.

Single Component Program	Enter the number of user volumes required for the medium type selected. The number should be entered as two digits (01,02,etc.).
Multiple Component Program System Line	Enter the number of user volumes required for the medium type selected. The number should be entered as two digits (01,02, etc.)

SECTION 2 CUSTOMER AND ORDER IDENTIFICATION

CUSTOMER NUMBER

Enter the 7-digit Customer Number in the space provided, ON EVERY IBM PROGRAM ORDER FORM SUBMITTED TO PID. Do not use dashes. Do not use the shaded area unless previously advised to do so. The Customer Number MUST BE ENTERED CORRECTLY because the user profile maintenance and the address to which the ordered program material will be shipped by PID will be determined from this number for all registered PID users (See Section 4). Once registered with PID, users are not required to enter their name and address on the order form.

ORDER NUMBER

This number is pre-printed on each form.

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If only one form is needed to specify the program order, enter "1 of 1". When more than one form is needed, number the forms "1 or n" "2 of n"..."n of n". Enter the CUSTOMER NUMBER ON EVERY FORM, and staple the forms together when sending to PID.

SECTION 3 USER VOLUME INFORMATION

The total number of user volumes (2400' magnetic tape reels, disk packs or cartridges) required to fill the program order, as identified program by program in Columns 23-24 of Section 1, should be accounted for in this section. These volumes may either be forwarded to PID or ordered from the appropriate IBM location. Complete Section 3 by entering the number of 2400' magnetic tape reels forwarded or ordered, the serial numbers of disk devices forwarded, or the plant order number, quantity and scheduled shipping dates of the disk devices ordered from San Jose.

Copy 1 of the IBM Program Order Form should accompany user volumes forwarded to PID. User volumes forwarded to PID should be externally labelled as follows:

2400' MAGNETIC TAPE REELS	DISK PACKS/ CARTRIDGES
1. Customer Number 2. *Order Number (Preprinted)	1. Customer Number 2. *Order Number (Preprinted) 3. Disk serial number
It is suggested that tape reels be of the aluminum hub variety and the tape secured by a tape end retainer	Disk packs should be shipped in the standard disk pack containers (Part #7350520). Disk cartridges should be shipped in the standard cartridge containers (Part #7350600).

* If multiple Program Order forms are required to complete the program order, enter the preprinted Order Number from the FIRST FORM on all user volume labels.

In lieu of forwarding tape reels to PID, reels may be purchased in conjunction with ordering programs. To purchase magnetic tape reels, Part #7035113 (10 1/2" diameter, 2400' reel, 3200 FCI, total surface tested, clear front, blue back, solid flanges), contact the IBM representative who can order them directly from PID by sending a completed copy of the Magnetic Tape Order Form #170-1138 to PID together with Copy

1 of the Program Order Form. Part #7035113 's the only part number PID carries. If ifferent tape reels are desired the IBM representative must send orders for them with Copy 1 of the Program Order Form to the Boulder Tape Center. The Tape Center will forward the reels and the Program Order Form to PID. This procedure will, of course, extend total turnabout time and delay receipt of the program.

Disk packs and disk cartridges may be ordered from San Jose in conjunction with ordering programs. Contact the IBM representative for assistance. Copy 1 of the Program Order Form should be sent directly to PID. Upon receipt of the volumes, PID will fill the order in the normal manner.

SECTION 4 USER REGISTRATION

Section 4 is completed to register a new PID user and to modify or delete previous registrations. Each user must be registered with PID prior to, or simultaneously with, his first program order. Once the user is registered Section 4 NEED NOT BE COMPLETED AGAIN until the registration data requires modification or deletion.

ACTION CODE

R: REGISTER a new PID user. All blocks of Section 4 must be completed.

M: MODIFY a previous registration by changing any or all blocks in Section 4. Each block modified must be completely respecified. Thus, a permanent change in the "Attention To" line of the user's name and address requires re-specification of the entire "Ship To" Information block of Section 4. The other blocks are left blank.

D: DELETE a previous registration. This action causes the deletion of the entire user profile (identified by the 7 digit Customer Number entered in Section 2) from the PID files. No other information is necessary.

S: SPECIAL "Ship To" - This Order Only. This action causes a "Ship To" Information substitution for this order only. The "Ship To" Information block must be completely specified. All other blocks are left blank. The permanent user registration data is not affected.

DP BRANCH OFFICE NUMBER/IBM LOCATION

Enter the IBM DP Branch Office number for the IBM customer or DP Branch Office user. Enter the IBM division, location and department codes for IBM users. Do not make entries in both fields.

MAGNETIC TAPE CAPABILITY

As stated in Section 1 (Columns 21-22), card programs will be volume shared for distribution on Distribution Tape Reels (DTR's) to users with magnetic tape capability. These DTR's will have a retriever placed at the front to enable the user to punch the programs out selectively. Enter here the preferred tape recording mode (trackage and density) for these volume shared DTR's. Check "None of These" if not a card user.

"SHIP TO" INFORMATION

Enter the complete shipping address. Do not use only a Post Office Box number since PID uses carriers other than the U. S. Mail. The ZIP CODE must be provided. In the "Attention To" line, if at all possible, enter a position title or department name/number, rather than the name of an individual.

SECTION 5 FOR IBM USE

Enter the last name and telephone number of the IBM representative familiar with the order. If the representative can be reached on the IBM network, enter NET and the correct seven-digit number. PID will call this person should clarification of any of the information on the Order Form be required.

IBM MANAGEMENT SIGNATURE

Each order should be signed by a member of Branch management or, in the case of internal IBM users, by the department manager. The order form should be dated (MM DD YY) and the Branch Office/Department number entered.

IBM WORLD TRADE USERS

World Trade users should order programs by contacting their IBM representative.

KEYWORD-IN-CONTEXT (KWIC) INDEX

The Keyword-in-Context Index lists all available programs by their search words and keywords. Search words are significant words that describe the program but do not appear in the title. Keywords are significant words which appear in the program title.

Each search word and each keyword is listed alphabetically in a column of the index. Their respective context words are printed to the right of the search word or keyword. There is an index entry for each search word and keyword. Certain words are not accepted as indexing words. They are considered to be too general to be useful for retrieval purposes and are therefore prevented from indexing. Hyphenated words are treated as one index word, with only the first word being significant. Figure 2 illustrates the operation.

Note that the # sign always precedes the first word of the title. An * sign precedes a search word. Each print line in the KWIC Index contains 43 positions. A search word group or title that is longer than 43 positions will show only those words that fall to the right of the search word or keyword being highlighted, up to the limits of one line. The remaining words become a separate entry on a different line. The + sign at the end of a line indicates there are more words in the search word group or title than are shown. The complete title may be found in the title section of the program abstract.

PROGRAM CLASSIFICATION CODES

Classification codes represent areas of function or application to which programs apply. Included below is a complete list of classification codes for all types of I, II, III, IV and Prior Use programs included in this catalog.

PROGRAMMING SYSTEMS TYPE I

/AL/ ALGOL Compiler
/AS/ Assembler
/CB/ COBOL Compiler
/CQ/ Communications Input/Output
/CL/ Control Program
/CV/ Conversion
/DC/ Documentor
/DM/ Data Management
/DN/ Diagnostic
/ED/ Editor
/EU/ Emulator Program
/FO/ FORTRAN
/IO/ Input/Output
/LM/ Library Material
/LD/ Loader
/MI/ Miscellaneous
/OS/ Operating System
/PL/ Programming Language/I Compiler
/PT/ Program Test
/RC/ Remote Computing
/RG/ Report Generator and Report Program Generator
/SI/ Simulator
/SM/ Sort/Merge
/SV/ Supervisor
/UT/ Utility

APPLICATION PROGRAMMING TYPE II

Industry-Oriented Programs

Distribution
/DP/ Publishing
/DR/ Retail
/DW/ Wholesale
/DX/ Other

Finance
/FB/ Banking
/FF/ Finance Companies
/FI/ Brokerage and Investment
/FX/ Other

Federal Government
/GF/ Government, Federal

Insurance
/IB/ Blue Cross and Blue Shield
/IF/ Fire and Casualty
/IL/ Life
/IX/ Other

Manufacturing
/MA/ Aerospace
/MD/ Drug, Food, Chemical Products
/ME/ Electrical and Machinery
/MF/ Fabrication and Primary Metals
/MP/ Petroleum and Industrial Chemicals
/MR/ Transporation Equipment
/MT/ Textiles and Paper
/MX/ Other

Service
/SC/ Communication
/ST/ Transportation
/SU/ Utilities
/SX/ Other

Universities and Government
/UC/ Colleges and Universities
/UG/ Government, State and Local
/UH/ Hospital and Medical
/US/ Secondary Schools
/UX/ Other

Industry-Independent Programs

Cross Industry Group
/CA/ Statistical Applications
/CC/ Process Control
/CM/ Mathematical Applications
/CN/ Numerical Control Applications
/CO/ Operations Research
/CP/ Critical Path Scheduling
/CR/ Information Retrieval
/CS/ Simulators
/CX/ Other

Engineering
/EC/ Civil Engineering
/EE/ Electrical Engineering
/EH/ Chemical Engineering
/EM/ Mechanical Engineering
/EN/ Nuclear Codes
/EO/ Optics
/EX/ Other

Exploratory
/XP/ Mathematics and Applications

System Engineering
/SE/ System Engineering Techniques

TYPE III AND IV PROGRAMS

Utility (External) Programs 00.
0 Unclassified
1 Multiple Utility
2 Flowcharting
3 Tape Handling
4 Disk Handling
5 Drum and Direct Data Devices
6 Graphic Display Devices

Utility (Internal) Programs 01.
0 Unclassified
1 Loading
2 Clear/Reset Memory
3 Check Sum Accumulative and Correction
4 Internal Housekeeping
5 Dump to Reload; Restore
6 File Organization
7 Self Checking Digit
8 Packed Data Handlers

Diagnostics 02.
0 Unclassified
5 Status Recorders

Programming Systems 03.
0 Unclassified
1 Assemblers
2 Compilers
3 Interpretive Systems
4 Input/Output Control
5 Report Generators
6 Preprocessing and Editing
7 Macros and Macro Generators
8 Functions and Subroutines

Testing and Debugging 04.
0 Unclassified
1 Dumping
2 Tracing
3 Test Data Preparation
4 Testing Systems
5 Break Point Print
6 Memory Verification and Searching

Executive Routines 05.
0 Unclassified
1 Monitor
2 Supervisor
3 Disassembly and Derelativizing
4 Relativizing
5 Relocation

Data Handling 06.
0 Unclassified
1 Sorting
2 Merging
3 Data Transmission
4 Table Operations
5 Conversion and/or Scaling
6 Character and Symbol Manipulation
7 Information Classification, Storage and Retrieval
8 Processing of List Type Data Structures

Input 07.
0 Unclassified
1 Binary
2 Octal
3 Decimal
4 BCD
5 Hexadecimal
6 Composite

Output 08.
0 Unclassified
1 Binary
2 Octal
3 Decimal
4 BCD
5 Hexadecimal
6 Plotting
7 Display
8 Composite

Systems Analysis 10.
0 Unclassified
1 Network Design
2 File and Core Requirement
3 Systems Design
4 Configurator

Simulation of Computers and Components 11.
0 Unclassified
1 Computers
2 Peripheral Equipment
3 System Component or Feature
4 Pseudo-Computer

Conversion of Programs and Data 12.
0 Unclassified
1 Data Conversion
2 Computer Language Translators

Statistical 13.
0 Unclassified
1 Descriptive
2 Univariate and Multivariate Parametric
3 Non-Parametric
4 Time Series and Auto Correlation
5 Probability Distribution Sampling, and Random Number Generators
6 Correlation and Regression Analysis
7 Analysis of Variance and Covariance
8 Sequential Analysis
9 Discriminant Analysis

Management Science/Operations Research 15.
0 Unclassified
1 Simulations
2 Linear Programming
3 Non-Linear Programming
4 Scheduling/Critical/Path/Pert
5 Games, Game Like Models and Game Theory
6 General Problem Solvers
7 Inventory Control

Engineering 16.
0 Unclassified
1 Aeronautical
2 Civil
3 Chemical
4 Electrical
5 Mechanical and Hydraulic
6 Petroleum
7 Nuclear
8 General

Sciences 17.
0 Unclassified
1 General
2 Nuclear Physics
3 Chemistry
4 Geology, Oceanography, and Geophysics

5 Biology
6 Social and Behavioral
7 Astronomy and Celestial Navigation

Nuclear Codes 18.
0 Unclassified

Financial 19.
0 Unclassified
1 Investing and Borrowing
2 Capital Stock
3 Taxes
4 Cash Custody and Forecasting
5 General Accounting
6 Auditing
7 Banking Operations

Cost Accounting 20.
0 Unclassified
1 Material Only
2 Labor Only
3 Work in Progress

Payroll and Benefits 21.
0 Unclassified
1 Payroll
2 Employee Benefits
3 Profit Sharing
4 Retirement
5 Insurance
6 Credit Union

Personnel 22.
0 Unclassified
1 Recruiting and Hiring
2 Inventorying Employees
3 Training
4 Performance Review
5 Administering Wages and Salary

Manufacturing 23.
0 Unclassified
1 Scheduling/Loading
2 Job Reporting
3 Bill of Materials Processors
4 Numerical Control
5 Control Systems

Quality Assurance Reliability 24.
0 Unclassified
1 Testing
2 Performance Analysis

Inventory 25.
0 Unclassified
1 Stocking and Issuing
2 Inventory
3 Equipment and Tool Inventory and Maintenance

Purchasing 26.
0 Unclassified
1 Preparing Purchase Orders
2 Matching Invoices
3 Accounts Payable
4 Purchase Analysis

Marketing 27.
0 Unclassified
1 Sales and Billings Forecasting
2 Promotion and Advertising
3 Bid or Request Analysis
4 Distributor or Territory Analysis

Sales Entered and Billed 28.
0 Unclassified
1 Order Entry and Scheduling
2 Invoicing
3 Accounts Receivable
4 Sales and Billing Analysis
5 Backlog Reporting

General Business Services 29.
0 Unclassified
1 Records Retention
2 Forms Management
3 Transportation
4 Printing and Reproduction

Demonstrations 30.
0 Unclassified
1 Display
2 Participation

Arithmetic Routines 40.
0 Unclassified
1 Real Numbers
2 Complex Numbers
3 Decimal
4 Floating Point

Elementary Functions 41.
0 Unclassified
1 Trigonometric
2 Hyperbolic
3 Exponential and Logarithmic
4 Roots and Powers
5 Geometry
6 Logical and Rounded

Polynomials and Special Functions 42.
0 Unclassified
1 Evaluation of Polynomials
2 Roots of Polynomials
3 Evaluation of Special Functions
4 Simultaneous Non-Linear Algebraic Equations
5 Simultaneous Transcendental Equations

Operations on Functions and Solutions of Differential Equations 43.
0 Unclassified
1 Numerical Integration
2 Numerical Solutions of Ordinary Differential Equations
3 Numerical Solutions of Partial Differential Equations
4 Numerical Differentiation

Interpolation and Approximations 44.
0 Unclassified
1 Table Look-Up and Interpolation
2 Curve Fitting
3 Smoothing

Operations on Matrices, Vectors and Simultaneous Linear Equations 45.
0 Unclassified
1 Matrix Operations

2 Eigenvalues and Eigenvectors
3 Determinants
4 Simultaneous Linear Equations
5 Vector Analysis

Insurance 50.
0 Unclassified
1 Life
2 Fire and Casualty
3 Pension and Welfare

Unclassified 99.
0 Miscellaneous

USING THE CATALOG

To locate a program begin by thinking of the significant words describing the desired program. Then look in the KWIC (Keyword-in-Context) Index for the keyword entry. The page number adjacent to the order number will then direct you to the corresponding program abstract. The reference code is set up as follows:

System	Order No.
360P	UT-098
1130	00.4.004
360E	19.1.001

Now refer back to the illustration in the section entitled, "Keyword-in-Context Index".

The page number listed at the end of the KWIC entry line will direct you to the program abstract. Each abstract describes the relevant program in enough detail to help you determine if the program will meet your requirements.

CONTRIBUTED PROGRAM ABSTRACTS

Figure 3 illustrates the format in which the Contributed Program abstracts appear. Explanations are included where the information is not self-explanatory.

(1) Program Order Number.
(2) Program Title.
(3) Additional Author Information and Secondary Classification codes. From left to right in the example:

N-User Organization Affiliation Code
C-Common S-Share
G-Guide N-Non-affiliated

UAN - User Organization Installation Code will appear here if applicable, otherwise will be blank.

XXXX -Submitter's own Program Identification if applicable.

06.5 06.6 -Secondary Classification (maximum of four).

(4) First line of Program Abstract.

LIST OF NEW PROGRAM PRODUCTS

Program Products are appearing in this catalog for the first time. All furture catalogs will contain a "List Of New Program Products", including those contained in all previous supplements.

LIST OF NEW TYPE III, IV AND PRIOR USE PROGRAMS

New Types III, IV and Prior Use programs are announced in each Catalog or Supplement in the table entitled, "List of New Types III, IV and Prior Use Programs."

Catalogs will contain all new Type III, IV and Prior Use programs, including those contained in all previous supplements, that have been accepted since the last published Catalog. All new Type III, IV and Prior Use Programs which appear in this catalog were accepted prior to December 31, 1970.

Abstracts for these programs can be found in those sections entitled "IBM PROGRAMS" or "CONTRIBUTED PROGRAMS". The code *N appears at the extreme right-end of the title line for each program appearing for the first time.

PROGRAM CORRECTIONS AND REVISIONS OF TYPE I, II, III AND IV PROGRAMS

There are two kinds of revisions to programs listed in this Catalog:

1. Changes in the program abstract,
2. Functional changes in the program documentation and/or machine readable material.

Abstract changes for Types I, II, III and IV programs are noted in this Catalog and its supplements. The code *M appears at the extreme right-end of the title line for each abstract that has been modified.

Modifications to program abstracts, documentation and machine readable material for Type III (IBM Employee Contributed) and Type IV (Customer Contributed) programs are listed in a special table entitled "List of Type I, II, III and IV Program Corrections and Revisions" preceding the KWIC Index.

Catalogs will contain all revisions, including those contained in all previous supplements, that have occured since the last published Catalog. All corrections and revisions which appear in this catalog were accepted prior to December 31, 1970.

If a user has received the program prior to the date indicated in the List of Type I, II, III and IV Program Corrections and Revisions and would like to receive the

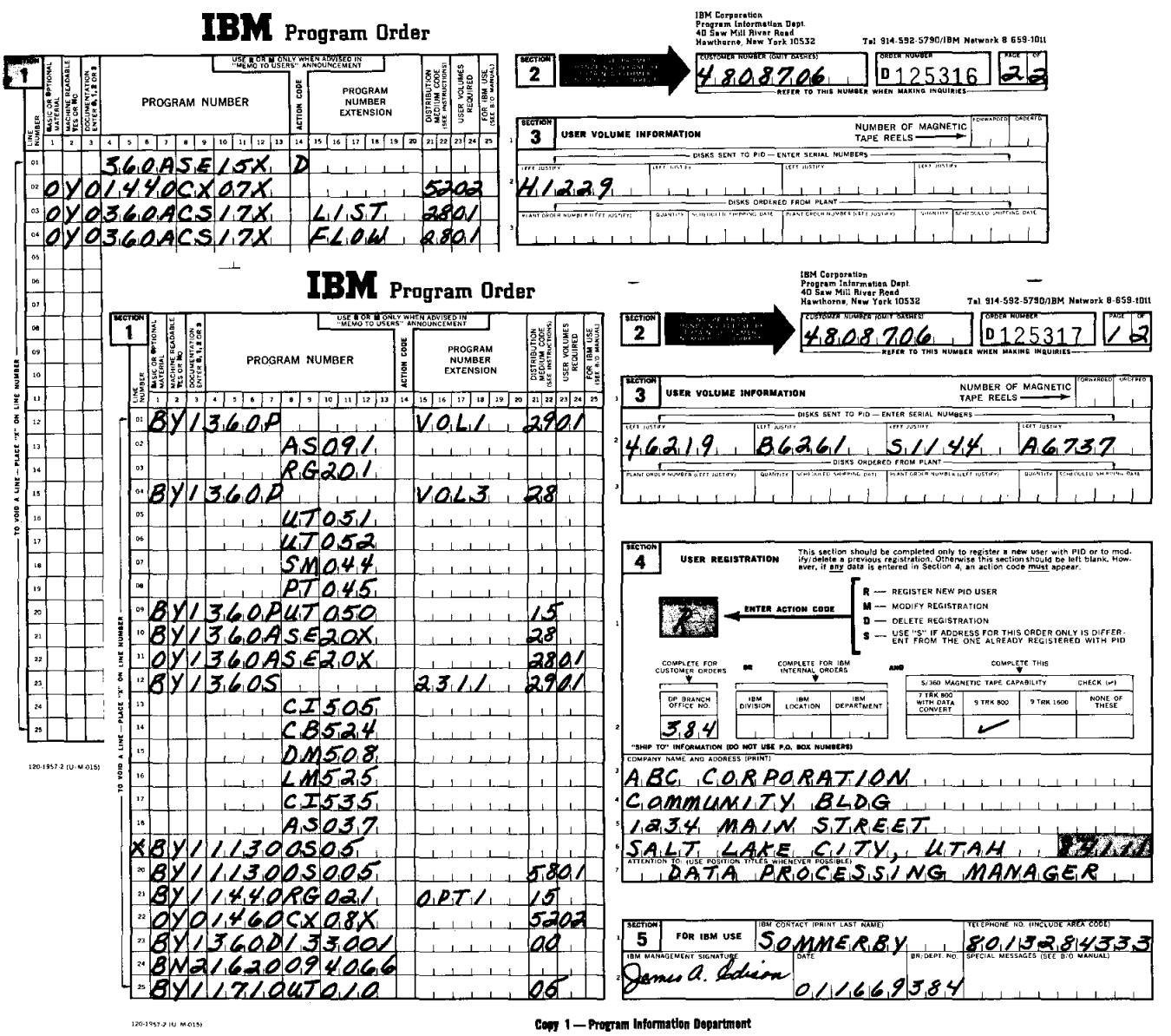
updated version, he must reorder the program.

Information concerning functional changes in program documentation and/or decks or tapes for Type I (Programming Systems) and Type II (Application Programs) can be obtained through your IBM Branch Office.

DELETED TYPE I, II, III AND IV PROGRAMS

Deleted Types I, II, III and IV programs are announced in each Catalog or Supplement in the table entitled "Accumulative List of Deleted Type I, II, III and IV Programs.

Catalogs will contain a list of all deleted programs, including those contained in all previous supplements, that have been deleted since the last published Catalog.



IBM Program Order

IBM Corporation
Program Information Dept.
40 Saw Mill River Road
Hawthorne, New York 10532
Tel 914-592-5790/IBM Network 8 659-1011

SECTION 2 — CUSTOMER NUMBER (OMIT DASHES): 4808706 — ORDER NUMBER: D125316 — PAGE 2 OF 2 — REFER TO THIS NUMBER WHEN MAKING INQUIRIES

SECTION 3 — USER VOLUME INFORMATION — NUMBER OF MAGNETIC TAPE REELS — FORWARDED — ORDERED

DISKS SENT TO PID — ENTER SERIAL NUMBERS: H1229

DISKS ORDERED FROM PLANT

SECTION 1 — USE ■ OR ■ ONLY WHEN ADVISED IN "MEMO TO USERS" ANNOUNCEMENT

LINE NUMBER	BASIC OR ◆OPTIONAL MATERIAL	MACHINE READABLE (YES OR NO)	DOCUMENTATION ENTER 0, 1, 2 OR 3	PROGRAM NUMBER	ACTION CODE	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM CODE (SEE INSTRUCTIONS)	USER VOLUMES REQUIRED	FOR IBM USE (SEE B/O MANUAL)
01				360ASE15X	D				
02	0	Y	0	1440CX07X				5202	
03	0	Y	0	360ACS17X		LIST		2801	
04	0	Y	0	360ACS17X		FLOW		2801	

TO VOID A LINE — PLACE "X" ON LINE NUMBER

120-1957-2 (U-M-015)

IBM Program Order

IBM Corporation
Program Information Dept.
40 Saw Mill River Road
Hawthorne, New York 10532
Tel 914-592-5790/IBM Network 8-659-1011

SECTION 2 — CUSTOMER NUMBER (OMIT DASHES): 4808706 — ORDER NUMBER: D125317 — PAGE 1 OF 2 — REFER TO THIS NUMBER WHEN MAKING INQUIRIES

SECTION 3 — USER VOLUME INFORMATION — NUMBER OF MAGNETIC TAPE REELS — FORWARDED — ORDERED

DISKS SENT TO PID — ENTER SERIAL NUMBERS: 46219 | B6261 | S1144 | A6737

DISKS ORDERED FROM PLANT

SECTION 1 — USE ■ OR ■ ONLY WHEN ADVISED IN "MEMO TO USERS" ANNOUNCEMENT

LINE NUMBER	BASIC OR ◆OPTIONAL MATERIAL	MACHINE READABLE (YES OR NO)	DOCUMENTATION ENTER 0, 1, 2 OR 3	PROGRAM NUMBER	ACTION CODE	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM CODE (SEE INSTRUCTIONS)	USER VOLUMES REQUIRED	FOR IBM USE (SEE B/O MANUAL)
01	B	Y	1	360P		VOL1		2901	
02					AS	091			
03					RG	201			
04	B	Y	1	360P		VOL3		28	
05					UT	051			
06					UT	052			
07					SM	044			
08					PT	045			
09	B	Y	1	360PUT		050		15	
10	B	Y	1	360ASE		20X		28	
11	0	Y	1	360ASE		20X		2801	
12	B	Y	1	360S			231	2901	
13					CI	505			
14					CB	524			
15					DM	508			
16					LM	525			
17					CI	535			
18					AS	037			
X	B	Y	1	1130S		05			
20	B	Y	1	1130S		005		5801	
21	B	Y	1	1440RG		021	OPT	15	
22	0	Y	0	1460CX		08X		5202	
23	B	Y	1	360DI		3001		00	
24	B	N	2	1620	09	4066			
25	B	Y	1	71	AUT	010		06	

SECTION 4 — USER REGISTRATION

This section should be completed only to register a new user with PID or to modify/delete a previous registration. Otherwise this section should be left blank. However, if any data is entered in Section 4, an action code must appear.

ENTER ACTION CODE: R

- R — REGISTER NEW PID USER
- M — MODIFY REGISTRATION
- D — DELETE REGISTRATION
- S — USE "S" IF ADDRESS FOR THIS ORDER ONLY IS DIFFERENT FROM THE ONE ALREADY REGISTERED WITH PID

COMPLETE FOR CUSTOMER ORDERS: DP BRANCH OFFICE NO.: 384 — OR — COMPLETE FOR IBM INTERNAL ORDERS: IBM DIVISION | IBM LOCATION | IBM DEPARTMENT — AND — COMPLETE THIS: S/360 MAGNETIC TAPE CAPABILITY / CHECK (✓)

7 TRK 800 WITH DATA CONVERT	9 TRK 800	9 TRK 1600	NONE OF THESE
	✓		

"SHIP TO" INFORMATION (DO NOT USE P.O. BOX NUMBERS)

COMPANY NAME AND ADDRESS (PRINT)

ABC CORPORATION
COMMUNITY BLDG
1234 MAIN STREET
SALT LAKE CITY, UTAH
ATTENTION TO: (USE POSITION TITLES WHENEVER POSSIBLE)
DATA PROCESSING MANAGER

SECTION 5 — FOR IBM USE — IBM CONTACT (PRINT LAST NAME): SOMMERBY — TELEPHONE NO. (INCLUDE AREA CODE): 801 328 4333

IBM MANAGEMENT SIGNATURE: James A. Edison — DATE: 01 16 69 — BR./DEPT. NO.: 384 — SPECIAL MESSAGES (SEE B/O MANUAL)

120-1957-2 (U-M-015)

Copy 1 — Program Information Department

Figure 1

KEYWORD-IN-CONTEXT (KWIC) INDEX

ABSOLUTE

TITLE	PROGRAM NO.	PAGE
ABSOLUTE PROGRAM LOADER. #SYSTEM/360	360P-UT-017	069
ACADEMIC SIMULATION PROGRAM. #360 GASP III+	360D-15.1.004	170
*ACCAP #PRE-ACCAP AND POST-ACCAP EDIT	360D-03.3.006	114
ACCEPT AND ALARM MACROS FOR DOS ASSEMELY+	360D-03.7.018	124
ACCESS STORED DATA. #COOLEY-TUKEY FAST+	360D-13.4.006	167
ACCESS DEVICE DUMP PROGRAM. #SYSTEM/360+	360D-00.4.013	101
ACCESS COMPUTING SYSTEM MODEL 44.	360A-CX-21X	013
ACCESS STORAGE DUMP. #DIRECT	360D-04.1.008	131
ACCESS METHOD FOR IBM SYSTEM/360 MODEL-44.	360D-03.4.019	117
ACCESS METHOD FOR IBM 2938 MODEL 2 WITH IBM+	360D-03.4.020	117
ACCESS FILE CONTROL. #MACROS FOR 8K BOS+	360D-03.7.012	123
*ACCESS #XEROX INFORMATION SYSTEMS DIVISION	360D-03.8.006	127
ACCESS COMPUTING SYSTEM. #REMOTE	360D-05.1.001	135
ACCESS TIME SHARING. #RACS/44 - REMOTE	360D-05.1.012	137
ACCESS METHOD FOR S/360 DOS. #BASIC AUTODIN	360D-06.3.003	142
ACCESS SUBROUTINE. #DISK1400 - S/360 1400+	360D-06.7.010	146
ACCESS METHOD FOR COMPATIBILITY (DAMCOM).	360D-11.2.001	158
ACCESS METHOD FOR DOS/360. #SYNCHRONOUS+	360A-SE-32X	030
ACCESS METHOD FOR OS/360. #SYNCHRONOUS+	360A-SE-33X	030
ACCESS STORAGE DEVICE INITIALIZATION+	360P-UT-213	076
ACCESS STATISTICAL SYSTEM. #REMOTE	360D-13.0.003	165
ACCESS COMPUTING SYSTEM (RAX). #REMOTE	360A-CX-17X	010
ACCOUNT ROUTINE. #XEROX INFORMATION SYSTEMS+	360D-03.8.006	127
*ACCOUNTING COST #ICES/360 PROJECT-I	360D-15.4.004	173

Figure 2

(1) 360D-12.1.013

(2) 360/1620 DATA DISK GENERATION FROM 1401 7-TRACK TAPE

AUTHOR....D. M. Knight

DIRECT TECHNICAL INQUIRIES TO...
D. M. Knight
Norden Div. of United Aircraft Corp.
Norwalk, Conn.

(3) *** S UAN XXXX 06.5 06.6 - - - - - ***

(4) DESCRIPTION - This stand-alone utility deck reads a 7 track 1401 tape (block size equals 2120, record length equals 106) that has been prepared from a 1620 - 1311 disk pack. The data is put through a character conversion and written on a 2311 disk in 1620 compatibility format. The method used is byte by byte scan of data, moving flags to flag bytes and packing condense each 106 digit record to the 63 byte record used in 1620 compatibility. The disk must

Figure 3

LIST OF NEW PROGRAM PRODUCTS

PROGRAM NO.	TITLE	PAGE NO.
5734-AS1	IBM SYSTEM/360 OPERATING SYSTEM ASSEMBLER H	001
5734-E12	COURSEWRITER III/OS VERSION 2	001
5734-EC1	RIGID FRAME SELECTION PROGRAM	001
5734-M51	OS/360 REQUIREMENTS PLANNING	002
5734-M52	OS/360 INVENTORY CONTROL	002
5734-RC1	ITF PL/1	003
5734-RC3	ITF BASIC	003
5734-UT3	1288 BASIC UNFORMATTED READ SYSTEM	004
5734-XM1	APL/360 - DOS	005
5734-XP1	PROJECT MANAGEMENT SYSTEM/360	005
5734-XS1	GENERAL PURPOSE SIMULATION SYSTEM/360 (OS)	005
5734-XX2	SYSTEM/360 GRAPHIC ANALYSIS OF THREE DIMENSIONAL DATA	006
5734-XX8	SYSTEM/360 LEARN ATS-OS	006
5736-CX1	GENERALIZED INFORMATION SYSTEM	007
5736-CX3	INFORMATION MANAGEMENT SYSTEM/360 (IMS/360)	007
5736-D31	CONSUMER GOODS SYSTEM (COGS) - ALLOCATION	008
5736-D32	THE CONSUMER GOODS SYSTEM (COGS) FORECASTING	008
5736-D41	ORDER ALLOCATION SYSTEM	009
5736-D51	AGRIBUSINESS MANAGEMENT INFORMATION SYSTEM (AMIS)	009
5736-EC1	RIGID FRAME SELECTION PROGRAM (RFSP DOS/360)	010
5736-G21	LAW ENFORCEMENT MANPOWER	010
5736-G22	FILING AND SOURCE DATA ENTRY TECHNIQUES FOR EASIER RETRIEVAL SYSTEM - LOW CORE (FASTER LC)	010
5736-H11	MEDICAL INFORMATION SYSTEMS PROGRAM (MISP)	011
5736-H12	SHARED LABORATORY INFORMATION SYSTEM (SLIS)	024
5736-H13	SHAS COMPATIBLE TELEPROCESSING	012
5736-K11	SYSTEM/360 TEXT PROCESSOR - EDIT/360	012
5736-M11	SYSTEM/360 CAPACITY PLANNING INFINITE LOADING	013
5736-M12	SYSTEM/360 CAPACITY PLANNING FINITE LOADING	013
5736-M13	SYSTEM/360 REQUIREMENTS PLANNING INTERFACE	014
5736-M31	SHOP FLOOR CONTROL	014
5736-N11	ADVANCED LIFE INFORMATION SYSTEM (DOS) VERSION 2	014
5736-N21	PROPERTY AND LIABILITY INFORMATION SYSTEM (PALIS)	015
5736-N22	PALIS ADDITIONAL FILE FACILITY (2314)	015
5736-P71	SYSTEM/360 ARRAY PROCESSING SUBROUTINE PACKAGE - PS	015
5736-P72	SYSTEM/360 ARRAY PROCESSING SUBROUTINE PACKAGE - OS	016
5736-RC1	DOS ITF PL/1	016
5736-RC2	DOS ITF BASIC	017
5736-SM1	IBM SYSTEM/360 DISK OPERATING SYSTEM TAPE AND DISK SORT/MERGE PROGRAM	017
5736-T21	TARIFF PUBLISHING SYSTEM (BOUND TARIFFS)	018
5736-T22	TRAFFIC PROFILE ANALYSIS SYSTEM (POINT-TO-POINT TARIFF ITEM SELECTION)	018
5736-U11	CUSTOMER INFORMATION CONTROL SYSTEM	019
5736-U12	POWER SYSTEM PLANNING PROGRAM	020
5736-UT1	THE 1288 BASIC UNFORMATTED READ SYSTEM	019
5736-XM1	APL/360 - DOS	021
5736-XP2	RESOURCE ALLOCATION FOR PROJECT CONTROL SYSTEM/360	022
5736-XS1	GENERAL PURPOSE SIMULATION SYSTEM/360 - DOS	022
5736-XS2	DATA/360 - DOS	022
5736-XX2	CFO AUTOCODER TO ASSEMBLER LANGUAGE INSTRUCTION SET TRANSLATOR (CATALIST)	023
5736-XX3	SYSTEM/360 LEARN ATS-DOS	023
5736-XX4	DATA BASE ORGANIZATION AND MAINTENANCE PROCESSOR	024

LIST OF NEW TYPE III, IV AND PRIOR USE PROGRAMS

All programs which appear on this list were accepted prior to December 31, 1969.

PROGRAM NO.	PROGRAM TITLE	PAGE NO.
360D-00.0.023	LISTUTIL	134
360D-01.4.011	XEROX - COMMUNICATIONS PRODUCTS DIVISION OS/360 MFT ACCOUNTING ROUTINES	156
360D-02.0.004	INDEX SEQUENTIAL ERROR BYTE CHECK ROUTINE	158
360D-03.0.014	MULTIPROGRAMMING SYSTEM (MPS)	161
360D-03.3.012	SPEAKEASY	167
360D-03.4.033	A 2250 MODEL 1 SIMULATION SUPPORT PACKAGE	172
360D-03.4.034	PS 44/2314 SUPPORT	172
360D-03.5.005	A SYSTEM TO PROCESS ABSTRACT CATALOGS AND RELATED INDICES	172
360D-03.5.006	RDC/1 REPORT DATA ON CONDITION	173
360D-03.5.007	REPORT WRITER	173
360D-03.7.033	BINARY SEARCH MACRO	183
360D-05.0.003	OS MASTER SCHEDULER INITIALIZATION IMPROVEMENTS	194
360D-05.1.019	O.S./M.I.S.P. VERSION 1.1	198
360D-05.1.020	PITT TIME SHARING SYSTEM AND ASSOCIATED LANGUAGE PROCESSORS	198
360D-05.2.012	44 MFT MULTIPROGRAMMING FOR THE 360 MODEL 44	201
360D-05.2.013	DOS/RESQUEUE - RESOURCE QUEUING AND USER SVC'S	201
360D-06.3.014	PHARMACY PROCESSING IN A HOSPITAL INFORMATION SYSTEM WITH MISP	204
360D-06.3.015	NURSING INSTRUCTION ORDER PROCESSING IN A MEDICAL INFORMATION SYSTEMS ENVIRONMENT	205
360D-06.7.025	MISP LABORATORY REQUISITION SYSTEM	212
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LIST OF TYPE III AND IV PROGRAM CORRECTIONS AND REVISIONS

These changes were requested by the authors.

Alphabetic Key to Material Revised:
A. Documentation
B. Machine Readable
C. Catalog Abstract

All programs which appear on the following list were accepted prior to December 31, 1969.

PROGRAM NO.	TITLE	CODES
360D-06.3.003	BASIC AUTODIN ACCESS METHOD FOR S/360 DOS	A B
360D-06.3.004	S/360 AUTODIN MULTIMEDIA TERMINAL PROGRAM	A B
360D-06.7.020	TEXT PAC, A S/360 NORMAL TEXT INFORMATION PROCESSING RETRIEVAL AND CURRENT INFORMATION SELECTION SYSTEM	A
360D-06.7.021	AUTO RAF - A SYSTEM FOR BUILDING AND USING RECORD ADDRESS FILES FOR DIRECT PROCESSING OF FILES ON SYSTEM/360	A C
360D-06.8.002	LPI	A C
360D-11.1.016	SYSTEM/360 PROGRAM TO EMULATE THE RCA 301	A B
360D-13.4.007	RESCALED RANGE TRANSFORM	A B C
360D-13.6.006	TOTAL SCAN MULTIPLE REGRESSION ANALYSIS WITH STANDARD ERROR OPTIMIZATION ROUTINE	A B C
360D-15.2.005	BRANCH AND BOUND MIXED INTEGER PROGRAMMING (BBMIP)	A B
360D-16.2.019	ICES/360 STRUDL - II VERSION 1, MODIFICATION 1	A B C
360D-16.2.022	GC-21	A C
360D-43.2.002	INTEGRAL EQUATION ALGORITHM FOR THE FORWARD PROBLEM OF ELECTROCARDOGRAPHY	A C

DELETED TYPE I, II, III, AND IV PROGRAMS

Key to Reason for Deletion

A. Low Usage
B. Withdrawn by the Author

PROGRAM NO.	PROGRAM TITLE	KEY
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360D-00.1.019	AN OS/360 MULTI-PURPOSE UTILITY FOR MULTI-PROGRAMMING	B
360D-00.3.001	MODIFICATION OF S/360 BPS MULTIPLE UTILITY FOR OFF-LINE SUPPORT TO OS/360	A
360D-00.3.014	ONTOS - "THE THING" FOR DOS/TOS USERS	B
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360D-03.3.008	COURSEWRITER III/OS A REAL TIME COMPUTER ASSISTED INSTRUCTIONAL SYSTEM	B
360D-03.4.025	COBOL HIGH RATE PRINTER ROUTINE DOS/TOS 360	B
360D-03.7.012	MACROS FOR 8K BOS DIRECT ACCESS FILE CONTROL	A
360D-03.8.007	EASING DOS TPLAB RESTRICTIONS	A
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360D-11.2.003	SIMULATOR FOR UNIVAC, I, II, AND EXTENDED ON SYSTEM/360	A
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360D-17.2.007	CERN GRING - A PROGRAM FOR KINEMATIC ANALYSIS OF EVENTS IN BUBBLE CHAMBERS	A
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CLASSIFICATION CODE INDEX (CONTRIBUTED PROGRAMS)

The Classification Code Index lists available contributed programs by their primary and secondary classification codes. Secondary classification codes are significant codes assigned by the author to classify subroutines and program operations other than those of the primary code. The secondary codes are selected from the program classification codes list (Type III and IV programs), and appear within the contributed program abstract.

Each primary and secondary classification code is listed numerically in the left-hand column. Each contributed program has a line entry for the primary classification code and for each secondary classification code assigned. The primary classification code is preceded by an asterisk (*). Each entry contains the classification code, program title, program number, and page number.

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5734-AS1 *N
IBM SYSTEM/360 OPERATING SYSTEM ASSEMBLER H

DESCRIPTION - The IBM System/360 Operating System Assembler H is a new assembler-language processor.

Assembler H utilizes main storage for storing intermediate data during the assembly process. This technique minimizes the time required for input/output operations.

Significant Language Functions Are:

- Symbols can have a maximum length of 63 characters.
- Named COM is supported.
- Extended mnemonics are provided for the RR type branch instructions.
- Literals are cross-referenced.
- COPY is allowed anywhere in the assembly. Code copied by COPY can include any statement type except ICTL. In particular, library macros can be copied in by COPY and treated as programmer macros.
- Macro definitions can occur anywhere before first use, and macros can be redefined at any point.
- OPSYN can be used anywhere in the source deck. Furthermore, it can be used with assembler operations and macro instructions as well as machine instructions.
- Macro instructions can be created by substitution.
- Up to nine continuation lines can be used for a statement.
- System variable symbols &SYSTIME and &SYSDATE are available for accessing the time and date of the assembly. The value for the third new system variable symbol, &SYSPARM, is specified in the PARM field of the EXEC card. The resulting character string can then be used by the assembler as a read-only SETC variable.
- A new assembler op code, AREAD, can be used inside macro definitions to process source cards following macro calls.
- LOCTR permits multiple location counters within a control section.

Significant Language Facilities Are:

- During system generation, default values of the PARM field options can be specified; DD names for data sets required by the assembler can be changed; and the machine op code table can be specified as standard, commercial, scientific, or universal.
- Multiple (batch) assemblies are allowed during a single job step.
- Error messages are printed in line at the point of occurence.
- Diagnosis of macro errors is improved by identification of the macro in which the error occurred or the line number of the model statement in error, nesting depth, or the variable parameter in error.

PROGRAMMING SYSTEMS - Assembler H is written in the Operating System assembler language. The Programming System requirements for Assembler H are: Release 17 or later of the System/360 Operating System with the PCP, MFT, or MVT option; Utilities; Linkage Editor E or F; and the Basic Sequential and Basic Partitioned access methods (BSAM and BPAM).

A simplified installation procedure for including Assembler H in the Operating System is provided. EXEC statement PARM field options, DD names for assembler data sets, and the machine instruction set (standard, scientific, commercial, or universal) may be specified or standard defaults may be used.

MINIMUM SYSTEM CONFIGURATION - Assembler H requires a minimum of Model 40, level H processing unit (256K) for the Operating System PCP option. Assembler H requires a minimum of a Model 50, level HG processing unit (384K) and a minimum region size of 200K bytes for the Operating System MFT or MVT options.

Assembler H uses the standard instruction set. However, it can assemble machine instructions from the System/360 standard, commercial, scientific, or universal instruction set; the set the assembler will accept is specified when Assembler H is added to the Operating System at system generation time.

BASIC MATERIAL
Unlicensed Documentation: One copy each of IBM System/360 Operating System Assembler H General Information Manual... IBM/360 Operating System Assembler H System Information... IBM/360 Operating System Assembler H Messages...IBM System/360 Operating Assembler H Program Product Specifications... IBM System/360 Operating System Assembler H Language Specifications... and 5 copies of IBM System/360 operating system H Programmer's Guide.

Licensed Machine Readable:
Object modules, sample problem, and job stream to catalog the object modules and execute the sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: PLM - Assembler H... Assembler H

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Listing (available on Microfiche).

Licensed Machine Readable: Assembler H source modules and macros.

Refer to local IBM Branch Office for ordering instructions.

5734-EC1 *N
RIGID FRAME SELECTION PROGRAM

DESCRIPTION - The Rigid Frame Selection Program (RFSP OS/360) must be used with the IBM System/360 Operating System (OS). RFSP OS/360 performs computations on data representing structure geometry, loads, member shapes, structure behavior and materials. From a user's inventory and material specifications RFSP selects the most economical members of that inventory to use. It operates in a highly modular fashion to find least-weight designs for members of different types of structures. RFSP design procedures apply to two- and three-hinged frames in steel, reinforced concrete or laminated wood. Material inventory, optimization, member segmentation, analysis and design calculations and preparation of a cutting list are performed for these frames.

Inventory calculations are made once for each different choice of material types and sizes. Design calculations are made for each different structure, for each different combination of dead, live and wind load. Users describe inventory choices, external structure dimensions and applied loads in a convenient free form language, implemented under the IBM Problem ANalyzer (PLAN). These statements determine which program modules and sub-routines are executed. Results are printed for inspection and may be stored on disk for modification and recalculation.

Users of RFSP OS/360 must be familiar with structural analysis. No programming or classroom training is required unless the user decides to alter or extend the RFSP OS/360 system. In this case, he must be familiar with OS/360 FORTRAN, OS/360 PLAN, and structural analysis and design.

PROGRAMMING SYSTEMS - RFSP OS/360 subroutines and modules are written in FORTRAN and require no further coding by the user.

MINIMUM SYSTEM CONFIGURATION - RFSP OS/360 requires a System/360 Model 2040G (131,072 bytes) as a minimum. The largest module of RFSP OS/360 requires a 60K core region.

Minimum essential I/O devices for RFSP OS/360 system generation, maintenance and operation include one 2841 Storage Control Unit, two 2311 Disk Storage Drives or one 2314 Direct Access Storage Facility, a 1052 Printer-Keyboard Model 7, and a printer, card reader, card punch and one magnetic tape unit supported by OS/360.

BASIC MATERIAL
Unlicensed Documentation: One copy of the Program Description Manual...Operations Manual and Program Description Manual with TNLs.

Licensed Machine Readable: Program subroutines and program modules in object form, initialization files and sample problems, and PLAN RFSP phrases.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of system manual Volume 4, listings of Compiled Code.

Licensed Machine Readable: The RFSP OS/360 source cards for both the subroutines and programs.

Refer to local IBM Branch Office for ordering instructions.

5734-E12 *N
COURSEWRITER III/OS VERSION 2

DESCRIPTION - Version 2 of Coursewriter III/OS is a program that can be used with System/360 models that have at least 128K of processor storage to develop and present course materials for Computer-Assisted Instruction (CAI).

Coursewriter III can be used for educational research, curriculum development, and operational uses of CAI. Course materials may be designed for basic or supplemental instruction and can include pretests to assess student capabilities, drill and practice problems, and laboratory simulations.

The System/360 through IBM 1050 or 2740 terminals, interfaces directly with students, authors of curriculum materials, monitors who assist students, and supervisors of CAI installations.

Coursewriter III applications exist primarily in:

- Teaching and learning research
- School and university intruction

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. Industrial and military training

The Coursewriter III programming system is made up of four elements:

. Coursewriter III Author Language
. Coursewriter III Processor Program
. Coursewriter III Input/Output Control Program
. Coursewriter III Student Response Processor

These elements, under control of the OS System/360, store, present, and administer the author-prepared course material.

The Coursewriter III Author Language provides capability for the developement and presentation of educational course materials through the terminals. This special language enables authors to control computer presentation of course material and processing of student responses. The contents and techniques of instruction can vary widely depending on the type of student, the learning environment, and the performance objectives of the course.

The Coursewriter III Processor Program operates interpretively and contains the control routines, author routines, student and monitor routines, and supervisor routines. Together, these routines direct System/360 to perform the specific tasks initiated by its users.

The Coursewriter III Input/Output Control Program maintains the current status of communication lines and their associated terminal stations. A Coursewriter III Student Response Processor Utility Program is also included which extracts and prints from selected records from the Coursewriter III recording tape.

PROGRAMMING SYSTEMS - The Coursewriter III/OS System is written in Assembly Language and uses BTAM, BDAM, and BSAM access methods under control of OS/360. Coursewriter III will operate with the OS/360 Primary Control Program (PCP), the OS/360 Multiprogramming with a Fixed Number of Tasks (MFT), or the OS/360 Multiprogramming with a Variable Number of Tasks (MVT).

MINIMUM SYSTEM CONFIGURATION - A minimum machine system includes a 2040 Model G Processing Unit with Decimal Arithmetic (3237), First Selector Channel (6980), Storage Protection (7520), 1052 Adapter Feature (7920)... 1052 Printer-Keyboard Model 7...1442 Card Read Punch Model N1...1443 Printer Model N1 with Selective Character Set (6402)...2841 Disk Storage Control Model 1...three 2311 Disk Storage Drives...2803 Tape Control Model 1... 2401 Magnetic Tape Unit Model 1...2701 Data Adapter Unit Model 1 with the Terminal Adapter (4645)...2740 Communication Terminal with Record Checking (6114), Printing Element 1167963.

Coursewriter III/OS requires a partition size of 59K to support five teleprocessing lines. The number of supported terminal lines can be increased with an associated increase in partition size.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Application Directory...Author's Guide...Student/Monitor User's Guide...Supervisor's Guide...Operator's Guide... Program Product Specification Sheet.

Licensed Machine Readable: Source Macro (for system generation), object modules, and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of the Operating System Programmer's Guide.

Licensed Machine Readable: Coursewriter III, Version 2, source program modules, listings, and flowcharts.

Refer to local IBM Branch Office for ordering instructions.

5734-M51 *N
OS/360 REQUIREMENTS PLANNING

DESCRIPTION - OS/360 Requirements Planning offers a mechanized approach to time series requirements planning for a large segment of manufacturing industries. This program product determines the net requirements for finished products and component parts, established planned orders based on predetermined order policy, and offsets the planned orders with respect to lead times.

Additional capabilities include projecting demand... consideration of safety stock, allocated quantity, shrinkage factors...PLANNED order policies include discrete, fixed quantity, least unit cost, and part period balancing... modifying PLANNED order policies by considering number-days-supply, minimum-maximum-multiple quantities, and cutoff dates... offsetting by a fixed or a calculated lead time. Processing variations include: complete generation of requirements. Requirements Alteration (revisions to gross requirements), and PLANNED Order Adjustment (revisions to planned orders). A customizing

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procedure permits a user to tailor the system to meet his specific requirements.

OS/360 Requirements Planning uses Item Master and Product Structure files created by the Chained File Management System. The Chained File Management System is provided with OS/360 Requirements Planning. The Chained File Management System provides the support necessary to organize and maintain the basic manufacturing data files of Item Master, Product Structure, Routing and Work Center Master. Also included with the Chained File Management System are macros to aid the user in writing programs for the exploitation of information captured in the files. These exploitation programs may be written in Assembler, COBOL or PL/1.

PROGRAMMING SYSTEMS - OS/360 Requirements Planning is written in Assembler Language utilizing the macro language facility. Assembler F is required. OS/360 Requirements Planning will operate under control of OS/360 Primary Control Program (PCP), OS/360 Multiprogramming with a Fixed Number of Tasks (MFT), or OS/360 Multiprogramming with a Variable Number of Tasks (MVT). This program product is released to work with OS Release 18 and all subsequent releases, versions and modifications unless so stated in a future revision of this document.

Chained File Management System programs require exclusive control of Chained File Management System files in MFT or MVT environment. If the files are to be shared, the user must implement logic to maintain file integrity.

MINIMUM SYSTEM CONFIGURATION - The requirements for OS/360 Requirements Planning are similar to those necessary to support the OS/360. The minimum machine configuration includes a S/360 Processor with main storage of 64K bytes or more for PCP, 128K bytes or more for PCP, 128K bytes or more for MFT, 256K bytes or more for MVT and appropriate I/O units to satisfy the OS/360 requirements for system console, system input, system output, system residence, and system data sets. The only additional requirements are direct access storage space for the OS/360 Requirements Planning data sets.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual...Operations Manual...Program Product Specifications.

Licensed Machine Readable: Source code plus a sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of System Manual.

Refer to local IBM Branch Office for ordering instructions.

5734-M52 *N
OS/360 INVENTORY CONTROL

DESCRIPTION - OS/360 Inventory Control offers a mechanized approach for installing an effective order point inventory system and projecting or forecasting future requirements based on past demand. This program consists of source programs and supporting documentation to provide:

. A detailed analysis of inventory items, based on usage and cost. The analysis is useful in determining how items are to be controlled.
. Calculation of order point and safety stock for items in the the item master file.
. Calculation of order quantities.
. An edit of the user demand data.
. Model selection based on user demand data, and initial update of the item master file for subsequent projection.
. An update of the item master file with the latest demand and projection of future demands.

Special empahsis is placed on ease of implementation. Programs are modular in design to permit the user to select only those options desired. The programs use item master files organized by the Chained File Management System of OS/360 Requirements Planning (5734-M51) or OS/360 Indexed Sequential Access Method (360S-IO-526).

PROGRAMMING SYSTEMS - OS/360 Inventory Control is written in Assembler Language utilizing the macro language facility. Assembler F is required. OS/360 Inventory Control will operate under control of OS/360 Primary Control Program (PCP), OS/360 Multiprogramming with a Fixed Number of Tasks (MFT), or OS/360 Multiprogramming with a Variable Number of Tasks (MVT). This program product is released to work with OS Release 18 and all subsequent releases, versions, and modifications unless so stated in a future revision of this docuement.

MINIMUM SYSTEM CONFIGURATION - The requirements of OS/360 Inventory Control are similar to those necessary to support the OS/360. The minimum machine configuration includes a S/360 Processor with main storage of 64K bytes or more

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for PCP, 128K bytes or more for MFT, and 256K bytes or more for MVT, and appropriate I/O units to satisfy the OS/360 requirements for system console, system input, system output, system residence, and system data sets. The only additional requirements are direct access storage space for the OS/360 Inventory Control data sets.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual... Operations Manual... Program Product Specifications Sheet.

Licensed Machine Readable: Source code plus a sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of Systems Manual.

Refer to local IBM Branch Office for ordering instructions.

5734-RC1 *N
ITF PL/1

DESCRIPTION - The System/360 Operating System Interactive Terminal Facility (ITF) provides problem solvers with PL/1 and/or BASIC programming in a time-sharing environment. Users can build, modify, save, retrieve, execute, and debug PL/1 and/or BASIC programs from remote terminals, many of which may be sharing the computer's CPU time simultaneously.

ITF: PL/1 (5734-RC1) consists of a Shared Language Component (SLC) joined to a PL/1 component.

The Shared Language Component (SLC) interfaces with OS/360 and the user terminals, feeds all PL/1 and/or BASIC programs to the proper language component, and then executes that component's output when requested. Execution requires no linkage editing by the user; all necessary linkages are automatically provided by the SLC. All system and terminal functions are controlled by the user from his terminal by commands given to the SLC. Some of the SLC facilities are:

- program editing on a single-line or multiple-line basis.
- dynamic debugging of programs through special execution monitoring aids. Values of variables may be displayed or changed and the flow of execution may be traced.
- text creation and modification (in the same way that a user creates a program, he can build, modify and save lines of text).
- on-line error messages for all errors recognized during translation, compilation, and execution.

Each user has a private library in which his programs, text, and data files are saved. All members of a private library are variable-length members of a partitioned data set and are compatible with OS data sets. Files can be used interchangeably by ITF: PL/1 and ITF:BASIC programs, that is, files created by ITF:BASIC programs can be used as input to ITF:PL/1 programs and vice versa, provided they are in the same library. A common library of programs, text, and files is also provided. It is maintained by installation-authorized personnel and its contents can be used by any user known to the system.

The PL/1 component takes the PL/1 statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the terminal user through the SLC as syntax errors are discovered. The PL/1 language supported by the PL/1 component is a subset especially suited to the problem solver. Among the language features are:

- decimal floating-point arithmetic with external precision of 6 (default) or 16 digits.
- label, bit-string, and character-string data.
- list-directed and edit-directed stream transmission (terminal and file I/O supported).
- a variety of mathematical built-in functions (SQRT, COS, ATAN, EXP, etc.).
- the INDEX and SUBSTR built-in functions for string handling applications.
- user-defined functions and subroutines.
- arrays of up to three dimensions for bit-string, character-string, and arithmetic data.

An additional feature of the PL/1 component is the PL/1 desk calculator mode. In this mode, PL/1 statements are executed immediately as they are entered. Program creation and modification is not possible in this mode, but

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previously created programs can be executed.

The BASIC component takes the BASIC statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the user through the SLC as syntax errors are discovered. The BASIC language supported by the BASIC component is based on the BASIC programming language developed at Dartmouth College. Its simplicity and ease-of-use is particularly suited to the problem solver. Among the language features are:

- arithmetic data with up to 15 digits of external precision.
- literal (character) data.
- a wide variety of mathematical built-in functions (SQR, LOG, COT, etc.).
- program, terminal, and file input/output.
- arrays of one or two dimensions (implicitly or explicitly defined).
- extensive matrix handling facilities (inversion, transpose, identity, determinant, multiplication, and more).
- single statement function definition.

PROGRAMMING SYSTEMS - ITF runs as a problem program under OS. It is released to operate under Release 18 of OS and all subsequent releases, versions, and modifications, unless so stated in a future revision of this document. It can run as a PCP job in a dedicated environment or as a high priority job in a partition of MFT to MVT. The minimum partition sizes are 44K bytes for PCP, 48K bytes for MFT, and 50K bytes for MVT. Both PL/1 and BASIC can be used in the minimum partition; no increase in partition size is required if the optional language feature is used.

Ten terminals can be supported in a minimum partition. Larger partitions will support more terminals. The maximum number of terminals that can be supported is 31.

MINIMUM SYSTEM CONFIGURATION - The main storage requirements are as follows: PCP requires a minimum of 64K bytes, MFT requires a minimum of 128K bytes, and MVT requires a minimum of 256K bytes.

BASIC MATERIAL
Unlicensed Documentation: OS ITF - PL/1 Program Product Specifications; six copies of ITF - PL/1 Reference Card; six copies of ITF - PL/1 Introduction; six copies of ITF - PL/1 Terminal User's Guide; ITF - PL/1 and BASIC Installation Reference Material.

Licensed Machine Readable: Relocatable code for the ITF Shared Language Component and the ITF - PL/1 Processor.

RELATED OPTIONAL MATERIAL
Licensed Documentation: OS ITF - PL/1 Program Logic Manual, TNL; ITF - PL/1 Microfiche Listing; Shared Language Component Microfiche Listing.

Licensed Machine Readable: Source code for OS ITF - PL/1 Processor and Shared Language Components.

Refer to local IBM Branch Office for ordering instructions.

5734-RC3 *N
ITF BASIC

DESCRIPTION - The System/360 Operating System Interactive Terminal Facility (ITF) provides problem solvers with PL/1 and/or BASIC programming in a time-sharing environment. Users can build, modify, save, retrieve, execute, and debug PL/1 and/or BASIC programs from remote terminals, many of which may be sharing the computer's CPU time simultaneously.

ITF:BASIC (5734-RC3) consists of the SLC joined to a BASIC component. An optional feature of ITF:PL/1 is BASIC and an optional feature of ITF:BASIC is PL/1.

The Shared Language Component (SLC) interfaces with OS/360 and the user terminals, feeds all PL/1 and/or BASIC programs to the proper language component, and then executes that component's output when requested. Execution requires no linkage editing by the user; all necessary linkages are automatically provided by the SLC. All system and terminal functions are controlled by the user from his terminal by commands given to the SLC. Some of the SLC facilities are:

- program editing on a single-line or multiple-line basis.
- dynamic debugging of programs through special execution monitoring aids. Values of variables may be displayed or

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changed and the flow of execution may be traced.

- text creation and modification (in the same way that a user creates a program, he can build, modify and save lines of text).

- on-line error messages for all errors recognized during translation, compilation, and execution.

Each user has a private library in which his programs, text, and data files are saved. All members of a private library are variable-length members of a partitioned data set and are compatible with OS data sets. Files can be used interchangeably by ITF: PL/1 and ITF:BASIC programs, that is, files created by ITF:BASIC programs can be used as input to ITF:PL/1 programs and vice versa, provided they are in the same library. A common library of programs, text, and files is also provided. It is maintained by installation-authorized personnel and its contents can be used by any user known to the system.

The PL/1 component takes the PL/1 statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the terminal user through the SLC as syntax errors are discovered. The PL/1 language supported by the PL/1 component is a subset especially suited to the problem solver. Among the language features are:

- decimal floating-point arithmetic with external precision of 6 (default) or 16 digits.

- label, bit-string, and character-string data.

- list-directed and edit-directed stream transmission (terminal and file I/O supported).

- a variety of mathematical built-in functions (SQRT, COS, ATAN, EXP, etc.).

- the INDEX and SUBSTR built-in functions for string handling applications.

- user-defined functions and subroutines.

- arrays of up to three dimensions for bit-string, character-string, and arithmetic data.

An additional feature of the PL/1 component is the PL/1 desk calculator mode. In this mode, PL/1 statements are executed immediately as they are entered. Program creation and modification is not possible in this mode, but previously

created programs can be executed. The BASIC component takes the BASIC statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the user through the SLC as syntax errors are discovered. The BASIC language supported by the BASIC component is based on the BASIC programming language developed at Dartmouth College. Its simplicity and ease-of-use is particularly suited to the problem solver. Among the language features are:

- arithmetic data with up to 15 digits of external precision.

- literal (character) data.

- a wide variety of mathematical built-in functions (SQR, LOG, COT, etc.).

- program, terminal, and file input/output.

- arrays of one or two dimensions (implicitly or explicitly defined).

- extensive matrix handling facilities (inversion, transpose, identity, determinant, multiplication, and more).

- single statement function definition.

PROGRAMMING SYSTEMS - ITF runs as a problem program under OS. It is released to operate under Release 18 of OS and all subsequent releases, versions, and modifications, unless so stated in a future revision of this document. It can run as a PCP job in a dedicated environment or as a high priority job in a partition of MFT to MVT. The minimum partition sizes are 44K bytes for PCP, 48K bytes for MFT, and 50K bytes for MVT. Both PL/1 and BASIC can be used in the minimum partition; no increase in partition size is required if the optional language feature is used.

Ten terminals can be supported in a minimum partition. Larger partitions will support more terminals. The maximum number of terminals that can be supported is 31.

MINIMUM SYSTEM CONFIGURATION - The main storage requirements are as follows: PCP requires a minimum of 64K bytes, MFT requires a minimum of 128K bytes, and MVT requires a minimum

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of 256K bytes.

BASIC MATERIAL
Unlicensed Documentation: OS ITF - PL/1 and BASIC Program Product Specifications; six copies of ITF - BASIC Reference Cards; six copies of ITF - BASIC Terminal User's Guide, TNL. One copy of ITF - PL/1 BASIC Installation Reference Material.

Licensed Machine Readable: Relocatable code for the ITF Shared Language Component and the ITF - BASIC Processor.

RELATED OPTIONAL MATERIAL
Licensed Documentation: OS ITF - BASIC Program Logic Manual, TNL; ITF - BASIC Microfiche Listing; Shared Language Component Microfiche Listing.

Licensed Machine Readable: Source code for OS ITF - BASIC Processor and Shared Language Components.

Refer to local IBM Branch Office for ordering instructions.

5734-UT3 *N
1288 BASIC UNFORMATTED READ SYSTEM

DESCRIPTION - The IBM Basic Unformatted Read System is designed to provide a convenient method for entering and processing typed data read by the IBM 1288 Optical Page Reader. This program performs the function of reading typed data from the 1288, editing the data, and storing it on a high-speed device for later processing. The data may be stored on either tape or DASD. Within the scope of unformatted reading on the IBM 1288 Optical Page Reader, this program provides complete flexibility of document size, format, and content. During the execution of this task, transition is provided from one batch of documents to another so that more than one group of documents may be processed.

Specifications for reading and editing input data documents are entered on a header document. A header document must be provided for each batch of documents to be processed. The following information is provided about the records in the batch:

- Coordinates to be used in reading the data documents.
- A batch ID for user identification purposes.
- The maximum number of lines to be used to include one input record.
- The maximum number of fields per input record.
- The serial and record number option to be used (if any).
- Whether short input records are to be processed.
- A user-written exit routine name.

The header document also contains the editing information which describes the individual fields in the output records.

Data documents contain the input data to be processed. The input data is typed in a line-by-line, left-justified listing. The documents are read in the unformatted mode by the 1288 Optical Page Reader. When the data has been read and edited, it is written onto a sequential output data set.

Two output data sets are produced by the program, EDTGOOD and EDITBAD. EDTGOOD contains all the valid records in the batch. EDITBAD contains all the invalid records from the batch along with error messages for each record. EDITBAD also contains the Batch Statistics Table for each batch of documents processed.

The program also provides for the use of an optional, user-written, exit routine. This routine can be used to further inspect each valid output record. For example, the routine could check for errors not detected by the program or perform applications such as self-checking digits.

Reading of the data documents continues until an end-of-batch document is read. When this document is read, end-of-batch statistics are logged on the EDITBAD data set in the Batch Statistics Table. The following general types of information are contained in this table:

- Number of each type of error encountered.
- Number of records written onto each output data set.
- Number of documents routed to each stacker on the 1288.

Batch-to-batch transition is provided if the end-of-batch document is followed by a new header document. End of job occurs if a new header document is not provided and end of file occurs on the 1288.

PROGRAMMING SYSTEMS - This program is designed to be executed under the IBM Operating System with any of the following options:

- PCP (Primary control program)
- MFT (Multiprogramming with a fixed number of tasks).
- MVT (Multiprogramming with a variable number of tasks).

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The 1288 Basic Unformatted Read System operates under any IBM System/360 configuration supported by OS with Type 1 programming support available for the IBM 1288 Optical Page Reader. The minimum amount of core storage required for task execution is 20K bytes. The program is designed to be executed under System/360 Operating System Release 19 and all subsequent releases, versions, and modification unless so stated in a future revision of this document.

MINIMUM SYSTEM CONFIGURATION - The minimum configuration for the installation and execution of this program includes:

- IBM System/360 processor Models 30,40,50,65, 65MP, 75, and 67 operating in 65 mode
- IBM 1288 Optical Page Reader Model 1.
- IBM 2400 series Tape Drive (one for each data set to be created on tape), or IBM 2311 Disk Storage Drive or IBM 2314 Direct Access Storage facility (if data sets are to be created on disk). Further information about the operating system can be obtained from your local sales representative.

BASIC MATERIAL
Unlicensed Documentation: 1288 - Basic Unformatted Read System... Program Product Specifications.

Licensed Machine Readable: Object materials for the 1288 Basic Unformatted Read System.

RELATED OPTIONAL MATERIAL
Licensed Documentation: 1288 Basic Unformatted Read System OS Program Logic Manual.

Licensed Machine Readable: Source module library with necessary job control language to assemble and catalog the program.

Refer to local IBM Branch Office for ordering instructions.

5734-XM1 *N
APL/360-DOS

DESCRIPTION - The APL language provides the problem-solver, be he engineer or programmer, scientist or salesman, with an improved means for setting down the steps he believes will yield a satisfactory solution. The availability of an APL terminal system gives him immediate access, at his demand, to a facility that will accept his statement of a solution, translate it at once into a computer program and execute on demand the program he has specified. This enables him to rapidly determine the adequacy of his solution. In the event that his output indicates a flaw in his logic, the APL system gives him the capability of entering corrections at once and then having his amended solution put to the test.

Features - APL Language - easy to learn... extremely flexible - applicable to simple or complex problems... completely computer independent... simple, uniform syntax... precise... concise... more than forty pre-defined operations (called 'functions')... powerful array-handling capability... ability for each individual user to create and preserve a virtually limitless number of functions of his own definition, which he can then use in precisely the same way as the functions that are predefined... use of familiar symbols for the ordinary arithmetic operations.

APL Terminal System - ability to share programs among some or all of the members of an installation... automatic preservation of work interrupted by communication failures... free-form decimal output... powerful program-editing facility... ability to save work for prolonged periods... a comprehensive set of utility programs to facilitate user-library management... effective debugging capabilities... automatic internal conversions of data representation with full double-precision arithmetic (16 decimal digits) when required... rapid response... a library structure built around workspaces that hold both programs and data... an immediate execution (desk calculator) mode completely free of irrelevant keywords... a comprehensive, integrated set of system commands for managing workspaces and libraries, and for other essential functions... three levels of security; account numbers, workspaces, and programs can be individually locked against use or display... visual fidelity between hard copy and transmitted entries to ensure reproducibility of results... succinct diagnostic reports... ability to guarantee the other jobs running concurrently with APL 360 a specified proportion of CPU time.

PROGRAMMING SYSTEMS - APL 360-OS is written in the OS/360 Assembler Language and requires no further coding by the system user.

APL 360-OS requires the following component and option of the System/360 Operating System: Multiprogramming with a Variable number of Tasks (MVT) (360S-CI-535.)

MINIMUM SYSTEM CONFIGURATION - The minimum central processor needed to run APL under Operating System/360 (MVT) is a System/360 Model 2050HG. APL 360-OS requires an MVT region

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the minimum isze of which is approximately 170K bytes. This figure is based on maintaining two 36K workspaces core-resident. The number of terminals that can be supported with reasonable response in a region of this size is dependent on many factors. Extrapolation from simulation results and experience on a 2050I indicates that approximately ten terminals can be serviced satisfactorily under the most restrictive conditions. Enlarging the region by allocating additional core to make three or four workspaces resident tends to increase (but at a decreasing rate) the number of terminals that can be serviced.

In addition to the devices required to run OS/360 (MVT), the following are needed: one 2311 Disk Storage Drive or one 2314 Direct Access Storage Facility module: one 2702 or 2703 Transmission Control; one 2702/3 subchannel address; four Type I user SVC numbers (designated at the time the APL system is installed); one 2741 Telecommunications Terminal or one 1050 Data Communication System containing at least one 1052 Printer-Keyboard; one 2400 series 9-track Magnetic Tape Unit.

BASIC MATERIAL
Unlicensed Documentation: APL/360-OS Operations and Installation Manual... APL/360 User's Manual.

Licensed Machine Readable: Relocatable modules, macro definitions, and distributed workspaces.

RELATED OPTIONAL MATERIAL
Licensed Documentation: Microfiche assembly listings.

Refer to local IBM Branch Office for ordering instructions.

5734-XP1 *N
PROJECT MANAGEMENT SYSTEM/360

DESCRIPTION - The IBM System/360 Project Management System (PMS/360) is a collection of computer program modules that can be combined to form the data processing elements of various management system applications for cost and scheduling planning and control. PMS/360 modules provide for:

- critical path and general cost analyses
- PERT and PERT COST capability
- resource allocation
- flexible report generation

PMS/360 can handle subnets ranging in size from 1,000 activities in a 44K region up to 32,000 in a 1004K region. Up to 253 subnets may be contained in a network and up to a combined total of 254 different networks and subnets can be held on one masterfile. Over 32,000 different resources are allowed and up to 25 resources may be specified per activity. The work breakdown structure allows up to 32,765 charge numbers at each of nine levels.

PROGRAMMING SYSTEMS - PMS/360 is written in OS/360 Assembler language and operates under the control of OS/360 using QSAM and BDAM data access methods. PMS/360 requires the Sort/Merge and Utilities components of the System/360 Operating System.

MINIMUM SYSTEM CONFIGURATION - PMS/360 with the Resource Allocation Processor requires a minimum of 128K bytes of core storage including OS/360 requirements and at least two 2311 Disk Storage Drives. PMS/360 without the Resource Allocation Processor, requires a minimum of 44K bytes of core storage over and above the requirement of OS/360. The standard instruction set and the decimal feature instruction set are used. If the system's output device is a printer, it must have 132 print positions.

Peripheral devices supported by PMS/360 include all devices supported by OS/360 where QSAM is an accepted access method. PMS is generally device independent. However, in the Report Processor (for cost reports), ORDFILE must be a tape as it is read backwards. Also, in the Resource Allocation Processor, the file QFILE must be on a direct access device. Minimally, PMS/360 needs one tape and two direct access devices over and above OS/360 requirements.

BASIC MATERIAL
Unlicensed Documentation: PMS/360 Program Description and Operations Manual.

Licensed Machine Readable: Program load modules and sample problems.

Refer to local IBM Branch Office for ordering instructions.

5734-XS1 *N
GENERAL PURPOSE SIMULATION SYSTEM/360 (OS)

DESCRIPTION - GPSS/360 Version 2 is an easy-to-use and easy-to-understand tool for modeling and examining the

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behavior of systems in the engineering and management science areas. Many applications of a complex, logical and procedure oriented nature which ordinarily defy mathematical description can be easily described and studied using GPSS. Varying environments may be simply introduced to enable the user to explore alternatives and identify capacity limitations. Both environment and activities may have random variations. Proposed changes to existing policies, methods, and operations can be subjected to critical performance criteria and evaluated. The user may also investigate and judge the value of new proposals without costly capital investments and without disturbing existing operations.

GPSS/360 Version 2 provides significant advantages over GPSS/360 Version 1. Major functions and capabilities of GPSS/360 Version 2 are:

- Complete compatibility with GPSS/360 Version 1.
- A real-time TIMER for model interruption and continuation.
- An easy-to-use interface between GPSS/360 and independently compiled FORTRAN routines.
- An excecution time core resident PRINT/TRACE/HELP feature

Version 2 of GPSS/360 also provides a number of user convenience and model enhancement features. Among these are additional SNA's for the absolute clock and terminations-to-go, an optional procedure for bypassing the often redundant second (absolute) input listing, and improved diagnostic capabilities. GPSS/360 Version 2 will also provide for blocking of all data sets associated with GPSS/360 for more efficient operation.

PROGRAMMING SYSTEMS - The GPSS/360 Version 2 program is written completely in Assembler Language and operates under control of OS/360. GPSS/360/OS will operate with the OS/360 Primary Control Program (PCP), the OS/360 Multiprogramming with a Fixed Number of Tasks (MFT), or the OS/360 Multiprogramming with a Variable number of Tasks(MVT). GPSS/360 has three standard entity allocations built into the program; however, any or all entities may be tailored to particular model needs by use of the GPSS/360 Reallocate feature. The following table shows the approximate minimum storage requirement for each of the three standard entity allocations (A, B, and C):

A	B	C
52K	96K	170K

These figures include the main storage required for the GPSS/360 program tables, control words, entities, and COMMON. The ability of the user to specify the required number of each entity type and required amount of COMMON through use of the Reallocation feature provides great flexibility in adapting the core requirements of GPSS/360 to regions and/or partitions which are smaller, between, or larger than the figures mentioned above. Understandably, the use of GPSS/360 optional features such as Jobtapes, SAVE/REAL, HELP routines, and core resident PRINT/TRACE/HELP feature during execution will increase the main storage required.

MINIMUM SYSTEM CONFIGURATION - The minimum system requirements for OS GPSS/360 Version 2 are similar to those necessary to support the OS/360. No additional devices should be required. The minimum machine configuration includes a 2040 Processing Unit Model G with the Universal Instruction Set and appropriate I/O units to satisfy the OS/360 requirements for system console, system input, system output, system residence, and system data sets. The only additional requirement is direct access and/or sequential storage space for the GPSS/360 data sets. The GPSS/360 program will be distributed on magnetic tape only. A 2400 Series Tape Unit (9- or 7-track with Data Conversion feature) must be available for program distribution and maintenance.

BASIC MATERIAL
Unlicensed Documentation: Introductory User's Manual... User's Manual... Operator's Manual.

Licensed Machine Readable: Object program card decks and sample problem card decks.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Licensed Machine Readable: Source program card decks.

Refer to local IBM Branch Office for ordering instructions.

5734-XX2 *N
SYSTEM/360 GRAPHIC ANALYSIS OF THREE - DIMENSIONAL DATA

DESCRIPTION - Graphic Analysis of Three-Dimensional Data (GATD) is an IBM 2250 man-machine oriented system with powerful facilities for on-line graphic analysis of three-dimensional data. It can be used by geologists, engineers, and other professional problem analysts.

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Here's how it operates... the user views a series of IBM 2250 displays called panels... by light pen interaction with graphic elements on these panels, the user can define, delimit, and access data; control disposition of intermediate and final data; select and enter program parameters; select programs to be executed; and make logical decisions on the basis of program generated displays. The light pen is used to guide the entire solution path from selecting of data through processing of data to final disposition of data.

The user supplies his own file read and search routines, as well as routines supporting his specific plotting device for final output. A group of GATD subroutines is provided which facilitates the interfacing between user files and GATD internal files. In addition, GATD provides for virtually open-ended user additions and modifications to the system.

PROGRAMMING SYSTEMS - The GATD system modules are coded in FORTRAN G and require the Graphic Programming Services for FORTRAN. The system operates under Operating System/360. In addition, the Problem Language ANalyzer (360A-CX-27X) and PLAN Graphic Support (360A-CX-34X) are required.

MINIMUM SYSTEM CONFIGURATION - System/360 Model 40H with Floating Point Arithmetic is required, having a minimum of 256K bytes of storage when used as a dedicated system. The minimum partition size is 150K when certain PLAN modules, graphic access methods, and PLAN Graphic Support subroutines are placed in the RAM or LINKPAC areas. GATD requires the following additional system facilities beyond those for normal OS/360 operation.

- Two IBM 2311 Disk Storage Drives or equivalent for PLAN, PLAN Graphic Support, and GATD system functions.
- One magnetic tape for each of the following options: save tape, restore tape, plotter interface file, user data interface file. These options may be used in any combination for a given run. A minimum of one magnetic tape is recommended for saving and restoring GATD data.
- One 2250 Display Unit Model 1 or one 2250 Display Unit Model 3 with 2840 Display Control Model 2 and Absolute Vectors (1002), Alphameric Keyboard (1245), 8K Buffer (1499), Character Generator (1880), Light Pen (4785), and Function Keyboard (5855).

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual... Terminal Operations Manual.

Licensed Machine Readable: Program modules and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System manuals.

Licensed Machine Readable: Source modules.

Refer to local IBM Branch Office for ordering instructions.

5734-XX8 *N
SYSTEM/360 LEARN ATS-OS

DESCRIPTION - LEARN ATS-OS assists in the learning of the ATS/360 command language for its use in source data entry, file maintenance, and text processing applications. The program is designed primarily for people with no prior ATS terminal operations knowledge. The training program operates concurrently with, and in the same partition or region as, the OS Version of ATS/360. This announced version of LEARN ATS operates only with Version 1 Modification Level 1 of ATS/360-OS.

LEARN ATS-OS is made up of three major components:

1. Additional and modified macros and application programs for accessing the program at the terminal.

2. Eight lessons which present the instruction and are ATS/360 special Permanent Storage documents, the contents of which cannot be altered or changed.

3. A student textbook which is used as an integral part of the education process.

PROGRAMMING SYSTEMS - The System/360 LEARN ATS-OS program is written in System/360 Assembler Language. It consists of new and modified application programs and macros incorporated into ATS/360-OS.

The ATS/360 program, in turn, is written in OS/360 Assembler Language and operates under control of OS/360, either with MFT (Version 2) or MVT. ATS/360-OS writes its peripheral (card, printer) output on disk or tape as an OS data set. A writer in another partition/region is required to perform the actual output to the peripheral device.

MINIMUM SYSTEM CONFIGURATION - The System/360 LEARN ATS-OS program runs under control of the OS version of ATS/360

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and therefore requires the same system configuration. LEARN ATS-OS adds approximately 300 bytes of core storage to the ATS/360-OS supervisor. Four new LEARN ATS-OS application programs are stored in the ATS application residence area and will require approximately five tracks on an IBM 2311 Disk Storage Drive or four tracks on an IBM 2314 Direct Access Storage Facility. A maximum of 60 application programs are allowed in ATS/360-OS.

The basic machine components used for ATS/360 consists of a System/360 Processing Unit with at least 22,258 bytes of dynamic main storage (see note below), Multiplexer Channel, Selector Channel... 1052 Printer-Keyboard (or other system console devices) a 2841 Control Unit with 2311 Disk Storage Drives (2 minimum), or 2314 Direct Access Storage Facility... 2701 Data Adapter Unit... 2702 or 2703 Transmission Control Unit... 2741 Communications Terminal with Feature 9812, Courier 72 standard IBM SELECTRIC printing element (part no. 1167043), and an appropriate line adapter.

NOTE: In addition to the 22,528 bytes of dynamic main storage specified above, provision must be made for the OS/360 Queued Sequential Access Method (QSAM) routines. Additional dynamic main storage will be required to support additional terminals and devices and optional ATS functions. For further information see System/360 Administrative Terminal System - OS Application Description Manual (GH20-0297).

The above configuration is in addition to OS/360 requirements. This configuration will preclude some ATS/360 document transmission capabilities depending on the selection of I/O devices and the availability of additional dynamic main storage. A typical ATS system supporting ten terminals and a peripheral printing capability will require 45,056 bytes of dynamic main storage in addition to that required by the QSAM routines. A typical 100-terminal system would require 115-140K bytes of dynamic main storage in addition to that required by the QSAM routines. In any case, a separate partition/region is also required to write the print/punch data set on the printer and punch.

One 2400 series Magnetic Tape Unit must be available for system generation and maintenance of ATS/360. One 2400 series Magnetic Tape Unit is desirable for ATS/360 peripheral operations. It is also desirable that at least one 2741 Communications Terminal be located near the system console.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual and the workbook.

Licensed Machine Readable: Source modules and changes for four macros and eight application programs, and eight lessons in archive format.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of the System Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-CX1 *N
GENERALIZED INFORMATION SYSTEM

DESCRIPTION - The IBM System/360 Generalized Information System (GIS) supports a wide variety of information processing activities by providing the facilities for defining, maintaining, and processing data files required in many commercial and governmental application areas. GIS provides general processing modules which are adapted to perform a given task on the basis of fixed and variable task parameters, identified at the time the task is introduced and on the basis of comprehensive stored data definitions and controls.

In addition to data, maintenance and general processing capabilities, GIS provides monitoring and utility programs which provide significant additional capabilities. GIS permits the retention and subsequent recall of user-entered task specifications in their external form. With this capability, single short queries or complete data descriptions may be saved by the system for subsequent use. GIS also provides for the retention and subsequent recall of user task specifications in their verified executable form. GIS makes available diagnostic reporting of real or potential errors in procedure specification and also makes available recording a system response and activity at file processing time. Included in the recording options are capabilities to provide an audit trail of transaction activity against any or all files and the ability to detect and record real or potential data errors at file processing time. The system provides security controls to restrict access to and modification of sensitive data.

The Generalized Information System is a user-oriented system. This is achieved through a language, which can be entered from remote terminals, that (a) permits the

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description of data files as collections of inter-related elements in logical structures and (b) expresses the processing requirements without concern for the devices, data formats, or mechanical operations involved in manipulating the data.

PROGRAMMING SYSTEM - Written in System/360 Operating System Assembler Language and requires no modification by the system user.

MINIMUM SYSTEM CONFIGURATION - GIS requires a System/360 Model 2050I (524,288 bytes) as a minimum, OS/360 with MVT -- Multi-programming with a Variable number of Tasks -- and OS/360 Utilities. Additionally, the OS/360 Sort and Link Edit functions must be available.

The dynamic main storage requirement for GIS is 153,600 bytes when operating under control of OS/360 MVT without terminals. A further allotment is necessary for access methods (BSAM, QSAM, BDAM, BPAM, and optionally -- ISAM). Additional available core storage may permit multi-programming with procedural execution(s) overlapped with one procedural compilation. If terminals are to be used, an additional region of main storage will be required for the user-written QTAM message control program.

In PCP, GIS (Basic), incorporated with GIS, operates on System/360 configurations ranging upward from a Model 2040G with the decimal arithmetic feature and direct-access secondary storage. The minimum machine configuration satisfies the GIS (Basic) requirement for a dynamic main storage of 90,112 bytes.

In MFT a model 2040GF (196,608 bytes) is recommended. This model allows in addition to the MFT control program and system tasks, the 90,112 bytes of dynamic main storage required for GIS (Basic) and a partition for other installation work.

While the dynamic main storage allocation of 90,112/153,600 bytes does include space for all the necessary parameter tables to support 16-file operation, it does not necessarily guarantee successful compilation of a 16-file procedure. In addition to the parameter tables, sufficient core must be available to hold, concurrently, the key DATA Description Table (DDT) information for each file. A reserved area of 15,000 bytes is included in the 90,112/153,600 bytes for this purpose. The actual space requirement for multi-file compilation is, however, highly dependent on file complexity, not only on the number of files involved, including the number of unique field and segment names, the actual number of fields and segments, and the quantity of edit, encode, and decode specifications, field redefinitions, and field security specifications. For this reason, it is not possible to set a fixed maximum (other than the system limit of 16) on the number of files which can be used in one procedure. A GIS utility is provided with the system to calculate the core requirements for key Data Description Table information during compilation for any specific combination of files described to GIS.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual.

Licensed Machine Readable: Object program load modules and sample problems.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Licensed Machine Readable: Source code.

Refer to local IBM Branch Office for ordering instructions.

5736-CX3 *N
INFORMATION MANAGEMENT SYSTEM/360 (IMS/360)

DESCRIPTION - The IBM System/360 Information System (IMS/360) enhances the capability of the Operating System/360 and facilitates the implementation of medium to large common data bases in a multi-application environment. This environment accommodates both teleprocessing and conventional batch processing operations concurrently or separately. IMS/360 has four major objectives:

1. To provide data organization methods that are conducive to the creation and maintenance of large common data bases and the multi-application use of these data bases.
2. To provide the means to permit the user to facilitate development and maintenance of a data base system in the batch processing environment.
3. To provide the user with the ability to extend his data base processing to the teleprocessing or data communication environment.
4. To provide the user with an efficient tele-communication ability for developing a high volume/rapid response on-line system.

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IMS/360 is made up of two major components: (1) the data base facility and (2) the data communication facility.

Data Base Facility - The data base processing capabilities of IMS/360 are provided through a facility called Data Language/1. The functions of data base definition, creation, access, and maintenance are assisted by these capabilities. The full data base facilities of Data Language/1 can be used in the IMS/360 batch processing or teleprocessing environment.

Data Communication Facility - Data Communication capabilities are characterized by the use of remotely located input/output terminals, connected to the computer, which provide the user with access to the data base. The communication network, consisting of IBM 2260 Display Stations and 1050 and 2740 communications terminals, enables the system to receive and transmit a variety of message types for multiple applications. Terminals need not be dedicated to specific applications. 2260 support is limited to single screen transmission only (maximum single message length of 960 characters) between the terminal and the message processing programs or other terminals. In addition a 2260 cannot be designated as a master terminal.

Control information describing each message type allows the system to initiate message processing or message switching. Message entry may result in both data base inquiry and update processing. A user-provided library of application programs for message and batch processing and a description of their data base requirements must be provided. These application programs may be written in any of the following OS/360 programming languages: Assembler Language, COBOL, or PL/1.

PROGRAMMING SYSTEMS - IMS/360 operates under Operating System/360 and is written in Assembler Language; teleprocessing and batch processing application programs may be written in either Assembler Language, COBOL or PL/1. For proper execution of IMS/360, system definition and system execution must be performed under the same OS/360 release.

The batch-only system operates under PCP, MFT, or MVT and uses Sequential Access Methods and Indexed Sequential Access Methods.

The teleprocessing and related batch system operate under MFT or MVT and, in addition to the items above, use: BTAM (with Communications Serviceability Facilities), SER 1 or Recovery Management Support, Sort/Merge service program (used by the IMS/360 System Log Utility Program), User-added SVC routines (three SVC numbers must be reserved for IMS/360).

If using MFT, Storage Protectection and Interval Timing are required, PCI Fetch, Resident Access Methods and Resident IDENTIFY and ATTACH macro instructions are highly recommended.

MINIMUM SYSTEM CONFIGURATIONS - Input/Output facilities used by batch-only IMS/360 (in addition to those required by OS/360, other non-IMS/360 application programs and the data base itself), include one 7-track (Data Conversion Feature required) or one 9-track magnetic tape unit (required for system distribution and maintenance)... 300 cylinders of 2311 Disk Storage for program storage and work space (or equivalent 2314 space). Additional input/output used by the teleprocessing IMS/360 program include one 1050 Data Communication System or 2740 Communication Terminal with appropriate control units... a total of two 9-track magnetic tape units. The 2260 Display Station can be added, but cannot be used as an IMS/360 Master Terminal.

Minimum system requirements are 128K bytes for batch-only PCP operation, and 256K bytes for teleprccessing with MFT. In the latter case, the system for all practical purposes, would be dedicated to on-line IMS/360 applications.

BASIC MATERIAL
Unlicensed Documentation: Application Directory... Program Description Manual... Operations Manual - Vol. I - Systems Operation... Operations Manual - Vol. II - Machine Operations.

Licensed Machine Readable: Macro-instruction Library and Load Module Library.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual - Vol. I - Program Logic... System Manual - Vol. II - Flowcharts... System Manual - Vol. III - Assembly Listings (furnished on Microfiche).

Licensed Machine Readable: Source Module Library.

Refer to local IBM Branch Office for ordering instructions.

5736-D31 *N

CONSUMER GOODS SYSTEM (COGS) - ALLOCATION

DESCRIPTION - The IBM Consumer Good System (COGS) - Allocation program provides the processor of consumer goods the ability to determine how much of various finished products to make and/or ship to stocking locations or distribution centers to satisfy service and inventory objectives while satisfying shipping incentives, and/or restrictions. Simulation of the ordering process is included to allow a preview of the effects of management policy alternatives.

COGS - Allocation provides: (1) A service point technique for ordering/shipping control. With the service point technique, all ordering/shipping decisions are based on attaining specified service objectives. (2) A variable interval allocation technique for determining how much to order/ship of each item. Stock is proportioned among items in the group to achieve optimum balance with respect to service objectives and minimum stock level, so that the joint order/ship quantity falls between specified minimum and maximum objectives. Three policies are available to choose from: (A) item service specified - minimize item inventory. (B) Group service specified - minimize group inventory. (C) Group inventory budget specified - maximize group service. (3) Simulation of the ordering/shipping process for up to 52-time periods in the future. The output is in a convenient plot form.

COGS - Allocation program product consists of three sub-programs: 1. Card-to-File (DIGCF): Included to expedite preparation of data for running the sample problem included in the program material. 2. Allocation-Main (DISMN): Performs the service point review of status records to determine when to order replenishment for the individual distribution centers or when to order production for the distribution network. Employs variable interval allocation technique in determining how much finished product to ship to each distribution center to satisfy inventory objectives and shipping constraints. 3. Allocation Pring (DIGAP): Prints in detail the output of Allocation-Main. It is included to print the results of the sample problem and serve as a guide to a user-written ordering/shipping document preparation program.

PROGRAMMING SYSTEMS - COGS - Allocation operates under the control of Disk Operating System/360. Source code is written in PL/1. DOS features are:

Supervisor - 2311 (6K)	360N-SV-474
System Control and Basic IOCS	360N-CL-453
Direct Access Method	360N-IO-454
Consecutive Processing Macros (Disk)	360N-IO-455
Group 1 Utilities (Unit Record & Disk)	360N-IO-461
Group 2 Utilities (Magnetic Tape)	360N-UT-462
Disk Sort/Merge	360N-SM-450
Basic PL/1	360N-PL-464
Consecutive Processing Macro OS (Tape)	360N-IO-456

When using a 65K machine, the supervisor may not exceed 12K.

MINIMUM SYSTEM CONFIGURATION -
System/360 Model 30 F (65K)
3237 Decimal Arithmetic
4427 Floating Point Arithmetic
7915 1051 Attachment
1051 Control Unit Model N1
3130 CPU Attachment
1442 Card Read Punch Model N1
1052 Printer-Keyboard Model 8
1443 Printer Model N1 (with Selective Character set 6402 and 63 character set typebar 9089)
5558 24 Additional Print Positions
2311 Disk Units (3 required - including system residence)
2415 Tape Unit Model 1 (2 required)

BASIC MATERIAL
Unlicensed Documentation: One copy each of Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: COGS - Forecasting source program, sample problem and flowchart printout.

Refer to local IBM Branch Office for ordering instructions.

5736-D32 *N

THE CONSUMER GOODS SYSTEM (COGS) - FORECASTING

DESCRIPTION - The COGS - Forecasting program product is based on a mathematical technique known as adaptive smoothing and is designed to produce forecasts for time periods of a year or less. Its design principle is that of building blocks: data, models, smoothing, forecasting, and error measurement. The data comes from past sales and/or estimates of demand from which the forecast is to be computed. Models are mathematical representations of reality -- in this case, the demand pattern. Smoothing is the repetitive process or revising the elements of the model in the light of new information about demand. After

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current estimates of the model have been derived, the forecast is simply the evaluation of the model for a future point in time. With each revision of the forecast itself, the measurement of the forecast error is also revised.

COGS - Forecasting provides:

1. An ability to forecast demand for products with different numbers of data collection periods per year.
2. An ability to screen all information presented for its validity and reasonableness.
3. A means of evaluating how well a model performs on a product's sales history.
4. A technique to update a model once it has been adopted without having to reinitialize.
5. A built-in monitoring of an adopted model's performance.

The COGS - Forecasting program product consists of five sub-programs.

1. Table generator program (DIHTAB): The purpose is to set up tables of constants to be used in forecasting groups of products. These tables consist of sets of smoothing constants, the maximum number of periods of sales that can be maintained and an outlier test value.
2. Initialize and update program (DIHIU): The purpose is to read cards containing information on file maintenance, sales history and various controls to supplement or override information provided by the sales master file.
3. Sales master link program (DIHLNK): The purpose is to extract data from the sales master file and with the information from DIHIU produce a file that is input to DIHTST.
4. Test and verify program (DIHTST): Of the four input programs, this is his main processing one. Where the other three are concerned with data input and reformating DIHTST is primarily concerned with analyzing the data for completeness and validity.
5. Simulation and forecasting program (DIHSFP): This program performs the model fitting updating, and analysis of model performance with the data supplied via the input programs. It also has forecast simulation capability.

PROGRAMMING SYSTEMS - COGS - Forecasting operates under the control of Disk Operating System/360.

DOS features used are:

Supervisor - 2311 (6K)	360N-SV-474
System Control and Basic IOCS	360N-CL-453
Direct Access Method	360N-IO-454
Consecutive Processing Macros (Disk)	360N-IO-455
Consecutive Processing Macros (Tape)	360N-IO-456
Group 1 Utilities (Unit Record & Disk)	360N-IO-461
Group 2 Utilities (Magnetic Tape)	360N-UT-462
Disk Sort/Merge	360N-SM-450
Basic PL/1	360N-PL-464

MINIMUM SYSTEM CONFIGURATION

System/360 Model 30F (65K)
3237 Decimal Arithmetic
4427 Floating Point Arithmetic
7915 1051 Attachment
1051 Control Unit Model N1
3130 CPU Attachment
1442 Card Read Punch Model N1
1052 Printer-Keyboard Model 8
1443 Printer Model N1 (with Selective Charater set 6402 and 63 character set typebar 9089)
5558 24 Additional Print Positions
2311 Disk Units (2 required - including system residence)
2415 Tape Unit Model 1 (2 required)

BASIC MATERIAL
Unlicensed Documentation: One copy each of Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: COGS - Allocation source program, sample problem, and flowchart printout.

Refer to local IBM Branch Office for ordering instructions.

5736-D41 *N
ORDER ALLOCATION SYSTEM

DESCRIPTION - The IBM Order Allocation System is designed to assist apparel manufacturers in the task of assigning or allocating available inventory to open orders in a manner consistent with management objectives and direction.

The Order Allocation System is distributed in the form of a private DOS/360 source library. The system also includes a private DOS/360 relocatable library containing the calling modules (sets of linkage editor statements) required to linkage edit assembled modules into operating programs.

The component programs of the system are: Condense inventory program - creates a condensed version of the

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user's inventory file for use by the other programs of the Order Allocation System... Order Selection Program - selects the orders on the user's order file that are to be processed during the next cycle, assigns them priority values, and creates a selected order file for use by the other programs of the Order Allocation System. The conditions for priority assignment and order selection are submitted on control cards... Allocation program - allocates stock from the condensed inventory file to the orders on the selected order file and updates the files. The conditions and rules for allocating stock are submitted on control cards... Shipping program - determines which previously allocated orders and units are to be shipped and updates the selected order and condensed inventory files. The conditions and rules for determining shipments are submitted on control cards... Print picking slips program - prints a picking slip for each order "shipped" by the shipping program... Adjustment program - adjusts the selected order and condensed inventory files to reflect variances between the "shipments" made by the shipping program and shipments actually made by the user's shipping department... Update orders program - updates the user's order file using the selected order file as input. Shipment history cards are punched for all shipped orders and shipped line items... Expand inventory program - prints inquiries and listings of groups of orders on the selected order file. The criteria for including orders on the listings are submitted on control cards.

PROGRAMMING SYSTEMS - The Order Allocation System is written in System/360 Assembler Language and operates under the control of DOS/360. Assembly, operation, and maintenance of the system are dependent upon the following programs:

DOS/360 Supervisor (6K)	360N-SV-474
DOS/360 System Control and Basic IOCS	360N-CL-453
DOS/360 Consecutive Disk IOCS Macros	360N-IO-455
DOS/360 Direct Access Method IOCS Macros	360N-IO-454
DOS/360 Group 1 Utilities(Unit Record and Disk)	360N-UT-461
DOS/360 Sort/Merge - Disk	360N-SM-450
DOS/360 Assembler	360N-AS-465

MINIMUM SYSTEM CONFIGURATION - The Order Allocation System can be run on a System/360 Model 25 or larger. The minimum machine configuration for a System/360 Model 25 includes:

. A 2025 Processing Unit Model DC (24,576 bytes)
. Two 2311 Disk Drives Model 1
. A Card Reader (2540, 1442*, 2501*,2520*)
. A Card Punch (2540, 1442*, 2520)
. A Printer (1403, 1443*)
. A 1052 Printer - Keyboard

*These devices require an MPX or Selector channel.

In a multi-programming environment, an 18K background partition is required. Some users with large block sizes and core tables may require a larger partition.

BASIC MATERIAL
Unlicensed Documentation: One copy of Program Description Manual... Operations Manual.

Licensed Machine Readable: Private Source Library Private Relocatable Library, and Sample Problem Files.

Refer to local IBM Branch Office for ordering instructions.

5736-D51 *N
AGRIBUSINESS MANAGEMENT INFORMATION SYSTEM (AMIS)

DESCRIPTION - The IBM Agribusiness Management Information System is a set of programs and procedures which makes available financial, tax, and management information to the agribusiness industry. AMIS is designed for operation by large ranches or farms, agricultural cooperatives, or others who provide accounting services. The IBM Agribusiness Management Information System produces reports which provide for effective farm management.

The member enters his balance sheet on the Agribusiness Management Information System's master files. He submits his normal business documents (checks, deposit slips, receipts, production reports) or a form to the cooperative. The data is punched into cards. AMIS performs the detailed verification of the data, updates or creates new master file records and produces all reports.

The reports for each subscriber are printed consecutively for better control over the reports. After printing, the reports and original input documents are returned to the member.

PROGRAMMING SYSTEMS - The Agribusiness Management Information System is written in DOS/360 Assembler Language and is distributed in the form of a private DOS/360 source statement library. Assembly, operation, and maintenance of the system depend on the following programs:

DOS/360 Supervisor 6K	360N-SV-474

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DOS/360 System Control and Basic IOCS	360N-CL-453
DOS/360 Indexed Sequential File Management System IOCS Macros (ISFMS)	360N-IO-457
DOS/360 Group 1 Utilities (Unit Record and Disk)	360N-UT-461
DOS/360 Assembler	360N-AS-465
DOS/360 Sort/Merge - Disk	360N-SM-450
BPS/360 Copy Disk to Tape and Restore Tape to Disk	360P-UT-061
BPS/360 Initialize Disk	360P-UT-069

This program product is released to work with DOS Release 22/23 and all subsequent releases, versions, and modifications unless so stated in a future revision of this document.

MINIMUM SYSTEM CONFIGURATION - This program operates on System/360 and compatible System/370 configurations, subject to the compatibility constraints announced for System/370.

The minimum machine configuration is a System/360 Model 25:

- A 2025 Processing Unit Model E (32,768 bytes)
- Three 2311 Disk Drives Model 1
- A 2540 Card Read/Punch Model 1
- A 1403 Printer Model 2

The AMIS programs require 25,200 bytes of core when the system is executed.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual... Specifications.

Licensed Machine Readable: Private source library and sample problem.

Refer to local IBM Branch Office for ordering instructions.

5736-FC1 *N
RIGID FRAME SELECTION PROGRAM (RFSP DOS/360)

DESCRIPTION - The Rigid Frame Selection Program (RFSP DOS/360) used with the IBM Problem Language ANalyzer for DOS/360 (DOS/360 PLAN) operates under control of the System/360 Disk Operating System (DOS/360). RFSP DOS/360 performs computations on data representing structure geometry, loads, member shapes, structure behavior and materials. From a user's inventory and material specifications, RFSP DOS/360 selects the most economical member of that inventory to use. It operates in a highly modular fashion to find least-weight designs for members of different types of structures. RFSP DOS/360 design procedures apply to two- and three-hinged frames in steel, reinforced concrete or laminated wood. Material inventory, optimization, member segmentation, analysis and design calculations and preparation of a cutting list are performed for these frames.

Inventory calculations are made once for each different choice of material types and sizes. Design calculations are made for each different structure, for each different combination of dead, live and wind load. Users describe inventory choices, external structure dimensions and applied loads in a convenient free form language, implemented under DOS/360 PLAN. These statements determine which program modules and subroutines are executed. Results are printed for inspection and may be stored on disk for modification and recalculation.

Users of RFSP DOS/360 must be familiar with structural analysis. No programming or classroom training is required unless the user decides to alter or extend RFSP DOS/360. In this case, he must be familiar with DOS/360, FORTRAN, PLAN and structural analysis and design.

PROGRAMMING SYSTEMS - RFSP DOS/360 subroutines and program modules are written in FORTRAN and require no further coding by the user.

MINIMUM SYSTEM CONFIGURATION - RFSP DOS/360 requires a System/360 Model 2030E (32,768 bytes) as a minimum, with the Floating Point Feature.

Minimum essential I/O devices for RFSP DOS/360 include a 2841 Storage Control Unit, two 2311 Disk Storage Drives, a 1052 Printer-Keyboard Model 7 and a printer, card reader, card punch supported by DOS/360 and any 2400 magnetic tape unit.

BASIC MATERIAL
Unlicensed Documentation: One copy of the Program Description Manual... Operations Manual and Program Description Manual with TNLs.

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Licensed Machine Readable: Program subroutines and Program Modules in object form, initialization files and sample problems, and PLAN RFSP phrases.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of System Manual Volume 4, Listings of Compiled Code.

Licensed Machine Readable: RFSP DOS/360 source cards for both the subroutines and programs.

Refer to local IBM Branch Office for ordering instructions.

5736-G21 *N
LAW ENFORCEMENT MANPOWER RESOURCE ALLOCATION SYSTEM (LEMRAS)

DESCRIPTION - The IBM Law Enforcement Manpower Resource Allocation System (LEMRAS) will assist the law enforcement administrator in determining his manpower requirements to answer the public's calls for police service. LEMRAS uses radio dispatcher-originated information on the types, location, occurrence times, and duration of events requiring the expenditure of police manpower resources. This information is maintained by the system in the form of averages, on a geographic and time oriented basis. The stored information is used to project future "calls for service" requirements both by geographic areas and time periods in a variety of statistical reports.

LEMRAS provides the capability to perform the following tasks:

1. Create Intermediate Geographic and Block Number Files.
2. Create Event, Georgraphic Index and Block Number Files.
3. Create Week-of-Year File and Hour-of-Week File.
4. Perform Updates to LEMRAS Files.
5. Loads all constants and control card parameter data used by the Report Generator.
6. Analyze user supplied control cards - process the event and time data bases to prepare statistical reports.

Modular programming techniques are employed by LEMRAS. The customer constructed tables and control constants are maintained. The user has a great deal of flexibility in generating reports to meet his particular needs.

PROGRAMMING SYSTEMS - LEMRAS operates under DOS/360 and uses the following feature of DOS: Direct Access Method... Consecutive Processing Macros... Indexed Sequential File Management System... Linkage Editor... Sort/Merge... FORTRAN IV... DOS Assembler.

MINIMUM SYSTEM CONFIGURATION - A 2030 Model F Processing Unit (65K) with Floating Point Arithmetic (4427), Decimal Arithmetic (3237), IBM 1051 Attachment (7915)... 1051 Control Unit Model N1, CPU Attachment (3130), First Printer Attachment (4409)... 1052 Printer-Keyboard Model 8... 2841 Storage Control Model 1... two 2311 Disk Storage Drives* Model 1 ... 2821 Control Unit** Model 1... 1403 Printer** (132 print positions) Model 2... 2540 Card Read Punch Model 1.

*One disk unit not occupied by the Disk Operating System (DOS) is required for data, programs, and working storage for

LEMRAS. **Any control unit and printer (132 print positions) compatible with the System/360 and DOS may be substituted for these units.

The source languages used by LEMRAS are FORTRAN and the DOS Assembler Language.

BASIC MATERIAL
Unlicensed Documentation: One copy each of Program Description Manual and Operations Manual.

Licensed Machine Readable: Source program modules, object program modules, and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of Systems Manual, two volumes -- System Manual Vol. 1 and Vol. 2 (microfiche only).

Refer to local IBM Branch Office for ordering instructions.

5736-G22 *N
FILING AND SOURCE DATA ENTRY TECHNIQUES FOR EASIER RETRIEVAL SYSTEM - LOW CORE (FASTER LC)

DESCRIPTION - FASTER LC is a programming system for retrieval and maintenance of indexed sequential files from remote terminals. The methods used are applicable to a wide

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variety of applications. FASTER LC incorporates a macro-language which provides for the writing of message processing programs on a functional level.

Some of the major functions supported by the macro-language include: retrieval of records from indexed sequential files, modifications and additions of ISAM records, data manipulation and Bollean logic capability, formatting of responses to the selected terminals (including paging commands), message routine with predefined program control or by terminal operator specification within programmed limits, and recording of audit data on a system logging device.

Through the use of BTAM, FASTER LC also provides line control to support a communication network consisting of combinations of IBM 1050 and IBM 2740 Model 1 typewriter terminals and the IBM 2260 (local and remote) display terminals.

FASTER LC operates a s a standard job in a single partition under DOS/360 with a minimum CPU of 48K storage. Minimum partition size may vary from 32K to 36K, depending upon user applications. Reference "System Configuration" and "Features" sections for additional information.

PROGRAMMING SYSTEMS - FASTER LC operates under IBM System/360 Disk Operation System (DOS/360 Release 21 and all subsequent releases unless otherwise stated in a future revision of this document). All FASTER LC routines are coded using Assembler Language (D Level). Type I support is utilized throughout, thereby retaining all normal diagnostic and serviceability aids inherent therein.

MINIMUM SYSTEM CONFIGURATION - System/360 2025 Model ED with facilities to run under DOS/360 BTAM, decimal arithmetic, interval timer, two 2311 disk drives, card reader/punch and printer combination of either 2540/1403 or 1442/1443 and a 1052 console typewriter. Supported terminals include 1050 (keyboard request is desirable to simplify terminal operations), 2740 (with station control and record checking), 2260 local and 2260 remote terminals. Dial-up terminals are not supported.

If batch processing programs are to run in conjunction with FASTER LC, a 2030 Model F will probably be required. The minimum partition size is 32K; if 2260L and record addition and best qualified record retrieval is required, the partition size may increase by 2K to 4K.

This program operates on System/360 and System/370 configurations, subject to the compatibility constraints announced for System/360. System/370 support will be concurrent with the availability of the DOS release supporting System/370.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: System macros for source library, FASTER LC routines for relocatable library, linkage editor cards for system operation, and the sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Licensed Machine Readable: Assembly listings and Flowcharts of FASTER LC Routines.

Refer to local IBM Branch Office for ordering instructions.

5736-H11 *N

MEDICAL INFORMATION SYSTEMS PROGRAM (MISP)

DESCRIPTION - MISP is a data communications interface between the Disk Operating System/360 and user written application programs with functions, selectable at generation time, to facilitate implementation of a medical management or hospital information system. MISP, which is distributed as assembler language source modules and macros, provides the user with the facilities to generate a system configuration applicable to the environment in which the system is to operate, a macro facility through which to communicate application program service requests, a macro facility to aid in implementing application program functions, a macro facility to generate interpretive tables for control of the 2760 Optical Image Unit, an interpretive application program to use the tables so generated, and system utilities to facilitate file generation and maintenance.

MISP provides:

- A data communications executive that requires minimal teleprocessing knowledge.
- Macro facilities for message processing programs (application programs) to communicate service requests to the executive.
- Macro facilities to build interpretive tables for control

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of the 2760 Optical Image Unit.
- An application program to interpret the 2760 interpretive tables.
- A set of system application programs for system control and general use.
- Library macros to implement a wide range of common application program functions.
- System utilities to facilitate file generation and maintenance.
- Ability to have multi-thread operation with resident or transient application programs.

The MISP executive includes the following facilities:

- Terminal Management - provides polling and addressing of terminals as specified by the user at generation as well as user requested reading and writing. Testing is facilitated by the ability to place a terminal in a test status, thereby allowing updates of only test data sets and redirection to the entering station of all messages that would normally be transmitted to other stations.

- Time Management - provides the ability to initiate programs based upon time of day, monitors application program execution intervals, allows suspension of system operations during slack periods and controls polling intervals for stations being time-polled.

- File Management - provides a data base control facility that requires minimal knowledge of the features of a data set to be built into application programs. This function allows direct access of data base records by relative location or an identification number.

- Program Check Protection - the executive intercepts all program checks and provides for the application program to continue operation or be terminated.

- System initialization, termination and suspension - provides for opening of all assigned devices, lines and data sets with an intial message to all stations. Allows operator control of system termination or suspension.

- Program Management - provides for initiation of standard application programs on a time basis or tc process messages and specification of program initiation sequence by application programs based upon programmed decisions. The application programs may be defined as resident or transient and may execute in one or more application program execution areas. Protection against simultaneous update of files and intermixing of unsolicited messages to terminals is not provided.

PROGRAMMING SYSTEMS - MISP is written in DOS/360 Assembler Language and operates under the control of DOS/360. It requires the DOS/360 supervisor to be generated to allow for operator communications, program check interception, interval timing and BTAM teleprocessing. Additional DOS/360 options, such as BTAM Communication Serviceability Features may be selected.

MISP operates as one task in one partition of DOS/360 and may operate in a dedicated environment or in one partition of a multiprogramming environment. The selection of multiprogramming or dedicated operation is the user's responsibility, as are the selection of system options beyond those required for the operation of MISP.

User written application programs reside in the DOS/360 Core Image Library and communicate directly with MISP via the macro interfaces provided.

This program product is released to operate with DOS/360 Release 21 and all subsequent releases, versions and modifications unless so stated in a future revision of this document.

MINIMUM SYSTEM CONFIGURATION - The configuration requirements are similar to those necessary to support the DOS/360. Decimal arithmetic feature, interval timer, direct access storage devices to contain the application data sets, the necessary core storage and the terminal configurations necessary to support the new application are the only additional features and devices required.

The system may have all supported terminals (on non-switched lines) of a specific type or a combination of:

- 1050 Data Communication System with a 1051 Control Unit Model 2 with any standard 1050 components attached.

- 2740 Communications Terminal Model 1 with Record Checking (6114) and with or without 2760 Model 1 Optical Image Unit (requires a 2760 attachment 8301).

The 1050 system may have the 1092 Programmed Keyboard or 1092/1093 Programmed Keyboard in tandem as an attached feature. Such a configuration can be treated as a normal 1050 configuration or have Special 1092 Support. If special 1092 Support is to be used the 1092 or 1092/1093 must include RPQ E38484.

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The appropriate line adapters and telecommunication control units must be included in the configuration.

Direct access storage devices may be 2311 Disk Storage Drives or the 2314 Direct Access Storage Facility.

Systems generation requires one nine track tape drive and the minimal DOS/360 requirements for cataloging to a library (private or system).

The minimum core storage requirements stated below for MISP exclude the following core storage areas: The fixed core storage requirements for the DOS/360 configuration, core storage for the necessary BTAM logic modules, and user processing programs. The basic executive modules of MISP require 23,200 bytes of core storage. The tables and areas used with the system are variable and dependent upon the user's requirements. For example, a system supporting ten 2740 or 2740/2760 terminals, ten data sets, and 50 programs requires approximately 6,550 bytes for tables and work areas.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual... Programmers Manual.

Licensed Machine Readable: Dos job stream to catalog MISP source modules... Macro instruction to create system generation job stream... Sample program... Sample program execution job stream.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-H12 Please refer to page 24 for abstract information.

5736-H13 *N

SHAS COMPATIBLE TELEPROCESSING

DESCRIPTION - SHAS Compatible Teleprocessing provides support for the IBM 2780, 2740, and 1050 terminals under DOS/360 QTAM. It is a teleprocessing application program product, representing significant extensions of terminal support previously available under the Shared Hospital Accounting System (Type II - 360A-UH-11X). (Version 2 or a higher level is a prerequisite). The program also extends the capabilities of SHAS to support IBM 2780, 2740 and 1050 terminals in a shared hospital application environment.

Documentation for this program is licensed and consists of a single manual containing description, operation, and systems information. The customer should retain and maintain assembly listings which should be available for servicing.

SHAS Compatible Teleprocessing (in a shared medical environment) extends the capability of SHAS to include support for the IBM 2780 terminal when used in leased-line multipoint configuration by inserting instructions in DOS/360 QTAM to communicate to the SHAS application... provides through macros, similar in function to those used to generate the SHAS teleprocessing executive, the ability to produce an appropriately configured software system to support appropriate hardware configurations of the IBM 1050, 2740, and 2780 terminals in a variety of combinations.

The user codes supplied macro instructions describing his terminal configuration. Assembly, which generates the expansion of these macros, creates a tailored teleprocessing message control program. Input received from terminals is stored on a data set for subsequent processing by SHAS. SHAS output directed for the terminal is queued on a data set for subsequent transmission. This program product includes a complete message processing program providing the teleprocessing support capability normally required.

PROGRAMMING SYSTEMS - SHAS Compatible Teleprocessing operates under DOS/360 and is written in DOS Assembler Language. The package requires SHAS Version 2 or later and has that program's dependencies. DOS/360 QTAM (Release 21 or later current release) is also required.

MINIMUM SYSTEM CONFIGURATION - (CENTRAL SITE) 2030F Processing Unit (64K) (Note that 2040G Processing Unit (128K) is required for concurrent operation of SHAS Compatible Teleprocessing and SHAS background application programs) with all QTAM and SHAS requirements (see SHAS Application Description Manual H20-0302) plus IBM Terminal Adapter Type I Model II (4640 with 9581) for IBM 1050 or IBM 2740 terminals or Synchronous Data Adapter Type II (7698 with 9060) for IBM 2780 terminal.

BASIC MATERIAL
Unlicensed Documentation: One copy of System Reference Manual.

Licensed Machine Readable: Source program modules for SHAS Compatible Teleprocessing Support for 2780, 2740, and 1050 Terminals under DOS/360 QTAM.

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Refer to local IBM Branch Office for ordering instructions.

5736-K11 *N

SYSTEM/360 TEXT PROCESSOR - EDIT/360

DESCRIPTION - System/360 Text Processor - EDIT/360 is a comprehensive text composition and editing system. It is designed to assist the printer or publisher in the process of transcribing text from the author's original manuscript to the final printed format. Text Processor - EDIT/360 extends the capabilities of the COMPOSITION/360 (360A-DP-08X) program and includes the control and function routines that handle disk-resident text and text format control input... performs line justification and formatting functions... produces generalized disk output records ready for input to user supplied composition device oriented routines. In addition, it provides justified output for final printing and editing purposes... input and output text listings and command listings for editing purposes... on-line storage of text and commands (Text Storage File)... index listing of stored documents... dumping of text for back-up and off-line storage... restoring (to Text Storage File) of text for additional modification... deletion of stored documents from the Text Storage File... modification to stored textual data on the Text Storage File by adding, deleting and replacing text and commands; scan replacement of text; moving, copying, and exchanging portions of text and commands. Output from Text Processor - EDIT/360 consists of generalized disk records which must be tailored for a specific systems output device by user-written routines. Modular programming techniques, user constructed font and systems constants tables, and user defined formats, together with the input and output device independence of Text Processor - EDIT/360, enable the user to tailor the system to his specific requirements. Text Processor - EDIT/360, in conjunction with user-written input and output programs and the HYPHENATION/360 (360A-DP-07X) program forms a comprehensive text handling system for the printing industry.

PROGRAMMING SYSTEMS - The program is written in System/360 Assembler Language and is designed to operate under control of the Disk Operating System (DOS). It operates in either batch mode or under the multiprogramming option. In the latter environment, EDIT/360 will operate in one program parition while the user's input/output modules will function in the next higher priority partition. A variety of configurations may be employed by the user in allocating available core storage. Shown here are two of the possible configurations for a minimum 64K Model 30 system:

Configuration I --	Supervisor 8K -- 10K Text Processor EDIT/360 34K - Background, User I/O 20K - Foreground 2.
Configuration II -	Supervisor 8K -- 10K, User Prog. - Background, Text Processor - EDIT/360 34K - Foreground 2, User I/O 10K - 12K - Foreground 1.

The minimum DOS system required for creating an operational system and executing the program must include Supervisor (8K or 10K), Disk Sort/Merge, Assembler, and Group 1 Utilities. The data management facilities of the Disk Operating System required by this program include System Control and Basic IOCS, Direct Access Method Macros, and Consecutive Disk IOCS.

MINIMUM SYTEM CONFIGURATION - System/360 Model F Processing Unit (64K bytes) with Interval Timer, Storage Protection and one Selector Channel, 1052 Printer-Keyboard with CPU attachments, 2841 Control Unit, and one 2311 Disk Storage Drive. These components are in addition to the DOS/360 requirements of one 2311 Disk Storage Drive, one card reader, one card punch, and one printer. Note that this minimum machine configuration does not include the text input/output sub-system devices necessary to implement an operational text processing system (e.g., magnetic tape, paper tape, data entry terminals, alphameric display terminals, etc.). It is the responsibility of the user to select these sub-system components and provide the necessary support programming based on his text processing system requirements.

The core residence requirement for the program is 34K bytes of storage. The remaining 30K bytes of storage are allocated by the user to the DOS Control Program and his own input and output modules. Any remaining space may be utilized as desired within normal DOS restrictions (e.g., a background partition program under DOS requires a minimum of 10K bytes). If the user of the minimum system configuration uses Teleprocessing support (such as BTAM, QTAM) in his input and/or output modules, there may not be sufficient storage space for a third program partition.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual... System Manual, Volume I-II.

Licensed Machine Readable: Source library.

Refer to local IBM Branch Office for ordering instructions.

5736-M11 *N

SYSTEM/360 CAPACITY PLANNING INFINITE LOADING

DESCRIPTION - This application program consists of source programs and supporting documentation for use in installing an effective work center loading function.

This program consists of two major phases: File creation and update, and infinite loading.

The file creation and update phase provides for two functions: (1) System Run File Creation which extracts work center capacity information from a work center master file and creates a system run file. (2) Load File Creation which determines labor or machine hours required for all open and planned orders in the Item Master or Subordinate Item Master File, based on information extracted from the standard routing file. These are system work files required in all subsequent phases.

The infinite loading phase provides for an infinite load report (by work center and period) and a load analysis report. The infinite loading phase is an accumulation of labor or machine hours required by time period and work center.

PROGRAMMING SYSTEMS - System/360 Capacity Planning - Infinite Loading is programmed in PL/1 and uses the following IBM programming systems: (1) IBM System/360 Disk Operation System (DOS/360), (2) IBM System/360 Disk Operating System Basic PL/1 and (3) Bill of Material Processor (360A-ME-06X).

MINIMUM SYSTEM CONFIGURATION -

Device or Feature	For S/360 Mdl 25	For S/360 Mdl 30
System/360 Central Processing Unit, 32K bytes (see note 1)	2025E	2030E
Decimal Arithmetic Special Feature	standard	3237
Control Unit for 1052 Printer-Keyboard	--------	1051 N1
Card Reader (see note 2)	2540	Any
Printer-Keyboard	1052 Model 7	1052 Model 8
Printer	1403 Model 2	Any with at least 132 print positions
Storage Control	---------	2841 Model 1
Disk Storage Drives as required to contain DOS/360 and the user's data files (minimum of 2)	2311 Model 1	2311 Model 1
OR		
Storage Control	---------	2314 Model A1
Disk Storage Drives as required to contain DOS/360 and the user's data files (see note 3)		2312 Model A1

NOTES:

1. The file creation and update phase as well as the infinite loading phase require a 32K minimum system. Each phase itself requires approximately 18,000 bytes excluding core required for DOS/360.
2. A System/360 card punch, while not used by System/360 Capacity Planning, is required for system preparation.
3. A system with no other direct access storage device except 2314 also requires a 2400 series tape drive for system preparation.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: Source code plus a sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of Systems Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-M12 *N

SYSTEM/360 CAPACITY PLANNING FINITE LOADING

DESCRIPTION - This application program consists of source programs and supporting documentation for use in the installation of an effective work center loading function.

This program consists of four major phases - file creation and update, connection (single level pegging), infinite loading, and finite loading (load leveling).

The file creation and update phase provides for two functions (1) System Run File Creation and (2) Load File

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Creation. These are system work files required in all subsequent phases.

The connection (single level pegging) phase provides for: (1) Calculation of Earliest Order Start Dates and (2) Linking component orders with parent orders through the use of connection records.

The infinite loading phase provides for an infinite load report (by work center and period) and a load analysis report.

The finite loading phase (load leveling) consists of programs which: (1) determine priority of orders and (2) load orders up to capacity limitations, called finite loading.

The functions of the program product are:

System Run File Creation - extracts work center capacity information from a work center master file and creates a system run file.

Load File Creation - extracts standard routing information then determines labor or machine hours required for all open and planned orders in the Item Master or Subordinate Item Master File.

Calculation of Earliest Order Start Date - determines earliest start date for orders consistent with availability of raw material and components.

Link Component and Parent Orders - links component orders with parent orders based on availability of raw material and components.

Infinite Loading - accumulates and prints labor or machine hours required for each work center, based on the earliest as well as the latest start date of the order. In addition, a load analysis report is printed which identifies those work centers which are lightly loaded or heavily overloaded.

Determination of Priority of Orders - determines relative importance of orders.

Finite Loading - one of three techniques that determines order start dates consistent with capacity and availability of raw material or components. The three optional techniques are:

- ESD Finite Loading - Attempts to schedule all orders as early as possible (to its ESD or earlist start date).
- LSD Finite Loading - Attempts to schedule all orders as late as possible (to its LSD or latest start date).
- Network Loading - Attempts to schedule all orders of a final assembly as an entity, in order to minimize total product lead time.

PROGRAMMING SYSTEMS - System/360 Capacity Planning-Finite Loading is programmed in PL/1 and uses the following IBM programming systems: (1) IBM System/360 Disk Operating System (DOS/360), (2) IBM System/360 Disk Operating System Basic PL/1, (3) IBM System/360 Disk Sort/Merge, associated with the IBM System/360 Disk Operating System (required in the connection phase and finite loading phase), and (4) Bill of Material Processor (360A-ME-06X).

MINIMUM SYSTEM CONFIGURATION

Device or Feature	For S/360 Mdl 25	For S/360 Mdl 30
System/360 Central Processing Unit, 48K bytes (see note 1)	2025 ED	2030 F
Decimal Arithmetic Special Feature	standard	3237
Control Unit for 1052 Printer-Keyboard	--------	1051 N1
Card Reader (see note 2)	2540	Any
Printer-Keyboard	1052 Mdl 7	1052 Mdl 8
Printer	1403 Mdl 2	Any with at least 132 print positions
Storage Control	--------	2841 Mdl 1
Disk Storage Drives are required to contain DOS/360 and the user's data files (minimum of 2)	2311 Mdl 1	2311 Mdl 1
or		
Storage Control		2314 Mdl A1
Disk Storage Drives as required to contain DOS/360 and the user's data files (see note 3)		2312 Mdl A1

NOTES:

1. The connection phase and the finite loading phase

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require a 48K minimum system with the exception of the network loading option which requires a 64K system.
2. A System/360 card punch, while not used by a System/360 Capacity Planning, is required for system preparation.
3. A System with no other direct access storage device except a 2314 also requires a 2400 series tape drive for system preparation.

BASIC MATERIAL
Unlicensed Documentation: One copy each of Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: Source code plus a sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of Systems Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-M13 *N
SYSTEM/360 REQUIREMENTS PLANNING INTERFACE

DESCRIPTION - System/360 Requirements Planning (360A-MF-05X) offers a mechanized approach to detailed requirements planning for a large segment of manufacturing industries. The system uses the Item Master and Product Structure files created by the System/360 Bill of Material Processor Program (360A-ME-06X), and performs time series planning to determine planned orders for finished product assemblies, sub-assemblies, parts and raw material based upon the input of forecasts and orders.

This program product provides for additional function of creating connection records which may be used as input to System/360 Capacity Planning - Finite Loading (5736-M12).

PROGRAMMING SYSTEMS - The programs are written in Assembler Language utilizing the macro language facility and operate under the IBM System/360 Disk Operating System. System/360 Requirements Planning (360A-MF-05X) is required as well as System/360 Bill of Material Processor (360A-ME-06X).

MINIMUM SYSTEM CONFIGURATION

Device or Feature	For S/360 Mdl 25	For S/360 Mdl 30
System/360 Central Processing Unit, 48K bytes	2025 ED	2030F
Decimal Arithmetic Special Feature	standard	3237
Control Unit for Printer-Keyboard	------	1051 N1
System/360 Card Reader (see Note 1)	2540	Any
Printer-Keyboard	1052 Mdl 7	1052 Mdl 8
System/360 Printer	1403 Mdl 2	Any (with at least 132 print positions)
Storage Control	----------	2841 Mdl 1
Disk Storage Drives (as required to contain DOS/360 and the user's data files) (minimum of 2)	2311 Mdl 1	2311 Mdl 1
or		
Storage Control	----------	2314 Mdl A1
Disk Storage Drives as required to contain DOS/360 and the user's data files (see Note 2)		2312 Mdl A1

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: Source code.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of Systems Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-M31 *N
SHOP FLOOR CONTROL

DESCRIPTION - Shop Floor Control consists of source programs and supporting documentation for use in the installation of an effective shop floor control system.

The program (5736-M31) consists of four major functions: (1) order release, (2) open order maintenance, (3) general information retrieval and (4) work list preparation. These

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functions provide:

- Updating of revised planned orders and component gross requirements from output of IBM System/360 Capacity Planning or user input.
- Component availability check of orders subject to release.
- Allocation of component requirements of orders that can be released.
- A material shortage report of orders that cannot be released due to insufficient availability of material.
- Release of orders regardless of material availability.
- A work file containing most information required for shop paperwork.
- Open order maintenance.
- Retrieval/report capabilities to generate various levels of detailed reports from data in the item master, work center master, open-order summary, and open-order detailed files.
- Retrieval of records for the user to update from shop floor feedback.
- Three order priority calculations for preparation of a work list. Calculations include: order due date, shortest operation first, and slack time for remaining operations.
- A work list report to indicate priority of orders at each work center.

PROGRAMMING SYSTEMS - System/360 Floor Control uses the following IBM programming systems: (1) IBM System/360 Disk Operating System (DOS/360), (2) IBM System/360 Disk Operating System Basic PL/1, (3) IBM System/360 Disk Operating System Assembler Language, (4) IBM System/360 Disk Sort/Merge associated with the IBM System/360 Disk Operating System and (5) Bill of Material Processor (360A-ME-06X) (Version 2 - Level 5) or the Data Base Organization and Maintenance Processor (5736-XX4). This program product is released to operate with DOS/360 Release 23 and all subsequent releases, versions and modifications unless so stated in a future revision of this document.

MINIMUM SYSTEM CONFIGURATION - This program operates on System/360 and compatible System/370 configurations, subject to the compatibility constraints announced for System/370. (See the guides to the IBM System/370 Models 155 and 165, GC20-1729 and GC20-1730). System/370 support will be concurrent with the availability of the DOS release supporting System/370.

The minimum machine configuration required for System/360 Shop Floor Control:

Device or Feature	For S/360,Model 25	For S/360,Model 30
System/360 central processing unit 48K bytes	2025 ED	2030 F
Decimal arithmetic special feature	Standard	3237
Control Unit for printer keyboard	---	1051 N1
System/360 card reader (see note 1)	2540	Any
System/360 card punch (see note 1)	2540	Any
Printer-Keyboard (see note 1)	1052,Mdl 7	1052 Mdl 8
System/360 Printer (see note 1)	1403,Mdl 2	Any with at least 132 print pos.
Storage control	---	2841,Mdl1
Disk storage drives as required to contain DOS/360 and the user's data files (minimum of 2)	2311,Mdl1	2311,Mdl 1
or		
Direct Access Storage Facility (see note 2)	---	2314,Mdl A1

BASIC MATERIAL
Unlicensed Documentation: Program Product Specification Sheet... Program Description Manual... Operations Manual.

Licensed Machine Readable: Source programs, source statement (macro) library book, and the sample problem decks.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-N11 *N
ADVANCED LIFE INFORMATION SYSTEM (DOS) VERSION 2.

DESCRIPTION - The IBM Advanced Life Information System (ALIS) is a transaction oriented application Program Package representing a comprehensive systems approach to the maintenance, processing and servicing of individual life insurance contracts. The system satisfies the major requirements for ordinary life insurance from the point in time immediately following policy issue, through

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maturity, expiry, or termination of the contract. ALIS provides the program logic for either a cash or revenue accounting system, as well as certain accident and health processing.

ALIS provides the capability to perform the following ordinary life insurance company data processing tasks:

- Balance, sort, and edit input for the daily file maintenance run.
- Process on a daily basis scheduled and non-scheduled activity.
- Each policy year, update on the policy master record cash values, dividends, renewable term rates, reserves and net premiums.
- Perform daily accounting control and prepare a daily policy accounting journal.
- Print (a) a transaction register, (b) status forms to answer inquiries, give error notification and indicate automatic processing, (c) error register, (d) termination register, and (e) issue register.
- Update policy exhibits.
- Perform policy valuation.
- Perform periodic file reorganization.
- Answer in-house inquiries to allow quotation of loan value, cash surrender value, modal premium amounts and policy status information.
- Produce extracts on a daily basis for user-written programs to handle commissions, internal revenue reporting, check-writing, loan activity, and the printing of premium notices.

Modular programming techniques and user-constructed tables and constants are used extensively in ALIS to enable the user to tailor the system to his individual company requirements and practices. For ease of modification, insurance logic programming is written in COBOL. For full utilization of System/360, environmental logic programming is written in System/360 Assembler Language.

PROGRAMMING SYSTEMS - ALIS operates under DOS/360 and uses the System Control and Basic IOCS, Consecutive Tape IOCS, Direct Access Method, Indexed Sequential File Management System, Group I, II, and III Utilities, Disk/Tape Sort/Merge or Tape Sort/Merge, Assembler Language, COBOL, Compiler Input/Output Modules, and BTAM (Basic Telecommunications Access Method). Users must become familiar with these components of the Disk Operating System.

MINIMUM SYSTEM CONFIGURATION - Daily Cycle and Valuation Programs - 2030F Processing Unit (64K) with at least 56K bytes available for program, data, and access method storage and the Decimal Arithmetic (#3237), Storage Protection (#7520), Interval Timer (#4760), Selector Channel (#6960), and 1051 Attachment (#7915)... 1051 Control Unit Model N1 with CPU Attachment (#3130), Systems Console Attachment (#9708), First Punch (#4410), First Reader (#4411), and First Printer (#4409) Attachments controlling one 1052 Printer-Keyboard Model 8... 2841 Storage Control with 2321 Attachment Feature (#8079)... 2321 Data Cell Drive Model 1 and 2311 Disk Storage Drive Model 1... four 2401 Magnetic Tape Units Model 1... 2803 Tape Control Unit Model 1... 2821 Control Unit with a 1403 Printer Model 2 and one 2540 Card Read Punch Model 1.

BASIC MATERIAL
Unlicensed Documentation: Application Directory.

Licensed Machine Readable: Source code and sample problem.

Refer to local IBM Branch Office for ordering instructions.

5736-N21 *N
PROPERTY AND LIABILITY INFORMATION SYSTEM (PALIS)

DESCRIPTION - These PALIS functions are designed to provide for Property and Liability Insurance Companies processing of both internal and external activity against a policy master for Homeowner's and Texas Automobile.

The following capability is provided: Homeowner's - (1) Rates and processes new business, renewals and premium endorsements. (2) Updates and creates history on the master record located on the IBM 2321 for premium and non-premium endorsements. (3) Processes claims transactions. (4) Provides facilities for handling reinstatements and cancellations. Where rating is performd, it is accomplished based on IBM's understanding and interpretation of the MLIRB rules.

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Automobile - (1) Rates and processes new business, renewals and premium endorsements based on IBM's understanding and interpretation of the bureau regulations for the State of Texas. (2) Recreates as of a specified date the affected portions of the master record based on previously processed historical information. Since users must supply accurate rate tables, IBM does not warrant the premiums calculated.

PROGRAMMING SYSTEMS - Processing is performed under DOS/360 and uses... System Control and Basic IOCS... Consecutive Tape IOCS... Direct Access Method... Group I, II, and III Utilities... Tape Sort/Merge... Assembler Language... COBOL... DOS Supervisor (6K)... and RPG.

MINIMUM SYSTEM CONFIGURATION - System 360/Model 40G with Decimal Arithmetic (3237) Selector Channel (#6980) and IBM 1052 Attachment (#7920)... A 1052 Model 007 Printer Keyboard... A 2841 Storage Control with IBM 2321 Attachment (#8079)... A 2321 IBM Data Cell, Model 1 (at least three of the magnetic tape units must be 9-track)... A 2821 Control Unit with a 1403 Printer, Model 2 and a 2540 Model Card Read/Punch.

BASIC MATERIAL
Licensed Machine Readable: Source code.

Refer to local IBM Branch Office for ordering instructions.

5736-N22 *N
PALIS ADDITIONAL FILE FACILITY (2314)

DESCRIPTION - Provides support for the 2314 for the Policy File, Random Index File, Automobile Rate Files and Homeowners Rate File under S/360 DOS. It extends the support previously available under PALIS Basic Program (360A-IF-10X). (Version 1 Modification Level 4 is a prerequisite).

PROGRAMMING SYSTEMS - The modules are written in Assembler Language and operate under the Disk Operating System. The Direct Access Method is used. This program product will normally be used in conjunction with PALIS Automobile Program (360A-IF-11X), PALIS Other Lines Program (360A-IF-13X), and PALIS Additional Functions (5736-N21).

MINIMUM SYSTEM CONFIGURATION - 2040 Unit Model G40 Processing Unit... Decimal Arithmetic... Selector Channel... 1052 Printer Keyboard... Four 2400 Tape Drives... 2821 Control Unit... 1403 Printer... 2540 Card Read Punch.

BASIC MATERIAL
Licensed Documentation: Systems Reference Manual... Program Product Specifications.

Licensed Machine Readable: PALIS Additional File Facility (2314) source.

Refer to local IBM Branch Office for ordering instructions.

5736-P71 *N
SYSTEM/360 ARRAY PROCESSING SUBROUTINE PACKAGE - PS

DESCRIPTION - The Array Processor Access Method (APAM) provides an interface between the user program and the Model 44 Programming System to give the FORTRAN and Assembler Language users access to the operations available in the IBM 2938 Array Processor. The user communicates with APAM through CALL statements that provide the information required to construct and execute a channel program on the Array Processor. APAM may be used to build and execute one Array Processor operation at a time, or it may be used to build several operations for chaining into a single channel program. The parameters in the CALL statements specify the operations to be performed and the data to be used, and they also specify how APAM is to build and execute the operations.

The Signal Processing Subroutines provide the user with a set of tools for use in signal enhancement in one and two dimensions. Included in the package are subroutines to synthesize low-pass, high-pass, band-pass, and band-reject recursive digital filters, routines to aid the user in analyzing the performance of filters, and a set of routines designed specifically for the one and two dimensional processing of petroleum seismic exploration data. These subroutines provide the user with the capability to solve some of the common problems encountered in signal enhancement.

PROGRAMMING SYSTEMS - The source language for the Array Processor Access Method is Assembler Language and the source language for the Signal Processing Subroutines is FORTRAN.

MINIMUM SYSTEM CONFIGURATION - Includes a 2044 Processing

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Unit with special interface (RPQ 885047), a 2938 Array Processor Model 1 (RPQW24563), and the machine configuration for the Model 44 Programming System with FORTRAN IV and Assembler Language. The Difference Equation in the Array Processor, optional RPQ813270, is also supported.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations manual.

Licensed Machine Readable: Program modules and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual

Licensed Machine Readable: Source modules.

Refer to local IBM Branch Office for ordering instructions.

5736-P72 *N
SYSTEM/360 ARRAY PROCESSING SUBROUTINE PACKAGE - OS

DESCRIPTION - The Array Processor Access Method (APAM) provides an interface between the user program and Operating System/360 to give the FORTRAN and Assembler Language users access to the operations available in the IBM 2938 Array Processor. The user communicates with APAM through CALL statements that provide the information required to construct and execute a channel program on the Array Proccessor. APAM may be used to build and execute one Array Processor operation at a time, or it may be used to build several operations for chaining into a single channel program. The parameters in the CALL statements specify the operations for chaining into a single channel program. The parameters in the CALL statements specify the operations to be performed and the data to be used, and they also specify how APAM is to build and execute the operations.

The Signal Processing Subroutines provide the user with a set of tools for use in signal enhancement in one and two dimensions. Included in the package are subroutines to synthesize low-pass, high-pass, band-pass, and band-reject recursive digital filters, routines to aid the user in analyzing the performance of filters, and a set of routines designed specifically for the one and two dimensional processing of petroleum seismic exploration data. These subroutines provide the user with the capability to solve some of the common problems encountered in signal enhancement.

PROGRAMMING SYSTEM - The source language for the Array Processor Access Method is Assembler Language and the source language for the Signal Processing Subroutines is FORTRAN.

MINIMUM SYSTEM CONFIGURATION - Includes a 2065 or 2075 Processing Unit, a 2938 Model 2 Array Processor (RPQ 815188), and a machine configuration suitable for Operating System/360 with FORTRAN IV and Assembler Language. The Difference Equation in the Array Processor, optional RPQ M40538, is also supported.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual.

Licensed Machine Readable: Sample Problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Licensed Machine Readable: Source Modules.

Refer to local IBM Branch Office for ordering instructions.

5736-RC1 *N
DOS ITF PL/1

DESCRIPTION - The System/360 Disk Operating System Interactive Terminal Facility (ITF) provides problem solvers with PL/1 and/or BASIC programming in a time-sharing environment. Users can build, modify, save, retrieve, execute, and debug PL/1 and/or BASIC programs from remote terminals, many of which may be sharing the computer's CPU time simultaneously.

ITF:PL/1 (5736-RC1) consists of a Shared Language Component (SLC) joined to a PL/1 component.
The Shared Language Component (SLC) interfaces with DOS/360 and the user terminals, feeds all PL/1 and/or BASIC programs to the proper language component, and then executes that component's output when requested. Execution requires no linkage editing by the user, all necessary linkages are automatically provided by the SLC. All system and terminal functions are controlled by the user from his terminal by commands given to the SLC. Some of the SLC facilities are:

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- program editing on a single-line or multiple-line basis.
- dynamic debugging of programs through special execution monitoring aids. Values of variables may be displayed or changed and the flow of execution may be traced.
- text creation and modification (in the same way that a user creates a program, he can build, modify, and save lines of text).
- on-line error messages for all errors recognized during translation, compilation, and execution.

Each user has a private library in which his programs, text, and data files are saved. Files can be used interchangeably by ITF:PL/1 and ITF:BASIC programs; that is, files created by ITF:BASIC programs can be used as input to ITF:PL/1 programs and vice versa, provided they are in the same library. A common library of programs, text, and files is also provided. It is maintained by installation-authorized personnel and its contents can be used by any user known to the system.

The PL/1 component takes the PL/1 statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the terminal user through the SLC as syntax errors are discovered. The PL/1 language supported by the PL/1 component is a subset especially suited to the problem solver. Among the language features are:

- decimal floating-point arithmetic with external precision of 6 (default) or 16 digits.
- label, bit-string, and charater-string data.
- list-directed and edit-directed stream transmission (terminal and file I/O supported).
- a variety of mathematical built-in functions (SQRT, COS, ATAN, EXP, etc.)
- the INDEX and SUBSTR built-in functions for string
- handling applications.
- user-defined functions and subroutines.
- arrays of up to three dimensions for bit-string, character-string, and arithmetic data.

An additional feature of the PL/1 component is the PL/1 desk calculator mode. In this mode, PL/1 statements are executed immediately as they are entered. Program creation and modification is not possible in this mode, but previously-created programs can be executed.

The BASIC component takes the BASIC statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the user through the SLC as syntax errors are discovered. The BASIC language supported by the BASIC component is based on the BASIC programming language developed at Dartmouth College. Its simplicity and ease-of-use is particularly suited to the problem solver. Among the language features are:

- arithmetic data with up to 15 digits of external precision.
- literal (character) data.
- a wide variety of mathematical built-in functions (SQR, LOG, COT, etc.)
- program, terminal, and file input/output.
- arrays of one or two dimensions (implicitly or explicitly defined.)
- extensive matrix handling facilities (inversion, transpose, identity, determinant, multiplication, and more).
- single statement function definition.

Through the CONVERT command provided by the SLC, PL/1 programs can be converted to a form acceptable to the DOS/360 PL/1(D) compiler. However, the user should recognize that certain ITF:PL/1 features are not compatible with the D-compiler. For example; ITF:PL/1 allows the third argument of the SUBSTR built-in function to be an arithmetic expression, but the D-compiler requires it to be a decimal integer constant. Also, because arithmetic data in ITF:PL/1 is internally represented in decimal floating-point form, execution results under the D-compiler may differ if the user is not careful in the declaration of arithmetic variables and in the use of arithmetic constants. The CONVERT command can also convert program data files to DOS--comparable data sets and vice versa.

PROGRAMMING SYSTEMS - ITF runs as a problem program under DOS/360. It is released to work with DOS Release 23 and all subsequent releases, versions, and modifications, unless so stated in a future revision of this document. No modification to DOS/360 is required. ITF can run in a dedicated environment or as a foreground job in a partitioned DOS/360 system. The minimum partition size is 40K bytes. Both BASIC and PL/1 can be used in the minimum partition; no increase in partition size is required if the optional language feature is used.

Ten terminals can be supported in a minimum partition. Larger partitions will support more terminals. The maximum number of terminals that can be supported is 31.

MINIMUM SYSTEM CONFIGURATION - The main storage requirement

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for DOS/360 is 48K bytes. In addition to the minimum hardware requirements for DOS/360 (including the decimal and floating-point instruction sets).

BASIC MATERIAL
Unlicensed Documentation: One copy each of DOS ITF-PL/1 Program Product specifications, six copies of ITF-PL/1 Reference Card, six copies of ITF-PL/1 Introduction, six copies of ITF-PL/1 Terminal Users Guide, ITF-PL/1 and Basic Installation Reference Manual.

Licensed Machine Readable: Relocatable code for the ITF Shared Language Component and the ITF-PL/1 processor.

RELATED OPTIONAL MATERIAL
Licensed Documentation: DOS ITF-PL/1 Program Logic Manual, ITF-PL/1 Microfiche Listing, Shared Language Component Microfiche Listing.

Licensed Machine Readable: Source code for DOS ITF-PL/1 Processor and Shared Language Component Microfiche Listing.

Refer to local IBM Branch Office for ordering instructions.

5736-RC2 *N
DOS ITF BASIC

DESCRIPTION - The System/360 Disk Operating System Interactive Terminal Facility (ITF) provides problem solvers with PL/1 and/or BASIC programming in a time-sharing environment. Users can build, modify, save, retrieve, execute, and debug PL/1 and/or BASIC programs from remote terminals, many of which may be sharing the computer's CPU time simultaneously.

BASIC (5736-RC2) consists of the SLC joined to a BASIC component. An optional feature of ITF: PL/1 is BASIC and an optional feature of ITF-BASIC is PL/1.

The Shared Language Component (SLC) interfaces with DOS/360 and the user terminals, feeds all PL/1 and/or BASIC programs to the proper language component, and then executes that component's output when requested. Execution requires no linkage editing by the user, all necessary linkages are automatically provided by the SLC. All system and terminal functions are controlled by the user from his terminal by commands given to the SLC. Some of the SLC facilities are:

- program editing on a single-line or multiple-line basis.
- dynamic debugging of programs through special execution monitoring aids. Values of variables may be displayed or changed and the flow of execution may be traced.
- text creation and modification (in the same way that a user creates a program, he can build, modify, and save lines of text).
- on-line error messages for all errors recognized during translation, compilation and execution.

Each user has a private library in which his programs, text, and data files are saved. Files can be used interchangeably by ITF: PL/1 and ITF: BASIC programs; that is, files created by ITF:BASIC programs can be used as input to ITF:PL/1 programs and vice versa, provided they are in the same library. A common library of programs, text, and files is also provided. It is maintained by installation-authorized personnel and its contents can be used by any user known to the system.

The PL/1 component takes the PL/1 statments entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax checking is performed and messages are transmitted to the terminal user through the SLC as syntax errors are discovered. The PL/1 language supported by the PL/1 component is a subset especially suited to the problem solver. Among the language features are:

- decimal floating-point arithmetic with external precision of 6 (default) or 16 digits.
- label, bit-string, and character-string data.
- list-directed and edit-directed stream transmission (terminal and file I/O supported).
- a variety of mathematical built-in functions (SORT, COS ATAN, EXP, etc.).
- the INDEX and SUBSTR built-in functions for string handling applications.
- user-defined functions and subroutines.
- arrays of up to three dimensions for bit-string, character-string, and arithmetic data.

An additional feature of the PL/1 component is the PL/1 desk calculator mode. In this mode, PL/1 statements are executed immediately as they are entered. Program creation and modification is not possible in this mode, but previously-created programs can be executed.

The BASIC component takes the BASIC statements entered by the user at his terminal keyboard and translates them into an intermediate form acceptable to the SLC. Syntax

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checking is performed and messages are transmitted to the user through the SLC as syntax errors are discovered. The BASIC language supported by the BASIC component is based on the BASIC programming language develcped at Dartmouth College. Its simplicity and ease-of-use is particularly suited to the problem solver. Among the language features are:

- arithmetic data with up to 15 digits of external precison
- literal (character) data.
- a wide variety of mathematical built-in functions (SQR, LOG, COT, etc.).
- program, terminal, and file input/output.
- arrays of one or two dimensions (implicity or explicitly defined).
- extensive matrix handling facilities (inversion, transpose, identity, determinant, multiplication, and more).
- single statement function definition.

Through the CONVERT commands provided by SLC, PL/1 programs can be converted to a form acceptable to the DOS/360 PL/1 (D) compiler. However, the user should recognize that certain ITF:PL/1 features are not compatible with the D-compiler. For example, ITF:PL/1 allows the third argument of the SUBSTR built-in function to be an arithmetic expression, but the D-compiler requires it to be a decimal integer constant. Also, because arithmetic data in ITF:PL/1 is internally represented in decimal floating-point form, execution results under the D-compiler may differ if the user is not careful in the declaration of arithmetic variables and in the use of arithmetic constants. The CONVERT command can also convert program data files to DOS--comparible data sets and vice versa.

PROGRAMMING SYSTEMS - ITF runs as a problem program under DOS/360. It is released to work with DOS Release 23 and all subsequent releases, versions, and modificatcns, unless so stated in a future revision of this document. No modification to DOS/360 is required. ITF can run in a dedicated environment or as a foreground job in a partitioned DOS/360 system. The minimum partition size is 40K bytes. Both BASIC and PL/1 can be used in the minimum partition; no increase in partition size is required if the optional language feature is used.

Ten terminals can be supported in a minimum partition. Larger partitions will support more terminals. The maximum number of terminals that can be supported is 31.

MINIMUM SYSTEM CONFIGURATION - The main storage requirement for DOS/360 in 48K bytes. In addition to the minimum hardware requirements for DOS/360 (including the decimal and floating-point instruction sets).

BASIC MATERIAL
Unlicensed Documentation: One copy each of DOS ITF-PL/1 and BASIC Program Product Specifications, six copies of ITF-BASIC Reference Cards, six copies of ITF-BASIC Terminal User's Guide, one copy of ITF-PL/1 BASIC Installation Reference Manual.

Licensed Machine Readable: Relocatable code for the ITF Shared Language Component and the ITF-BASIC Processor.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of DOS ITF-BASIC Program Logic Manual, ITF-BASIC Microfiche Listing, Shared Language Component Microfiche Listing.

Licensed Machine Readable: Source code for DOS, ITF-BASIC Processor and Shared Language Component Microfiche Listing.

Refer to local IBM Branch Office for ordering instructions.

5736-SM1 *N
IBM SYSTEM/360 DISK OPERATING SYSTEM TAPE AND DISK SORT/MERGE PROGRAM

DESCRIPTION - The 5736-SM1 Sort/Merge Program Product can arrange multiple files of logical data records according to a predetermined collating sequence, or merge files of previously sequenced records. The sequence of a file is determined by the contents of a control word, which may contain a maximum of 12 control fields. These fields must occupy the same position in each record. Either ascending or descending sequence may be specified for each of the control fields. The control field data may be zoned decimal, packed decimal, floating-point, fixed-point integer, character, or binary data.

The specifications of the sort program are:

- Records can contain one to 12 control fields with different data formats. Different sequencing may be specified for the fields. The sum of the control field lengths must be at least one but no more than 256 bytes.

- Input to a sort may be blocked or unblocked, fixed-length or variable-length records.

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- Input to a sort may be a maximum of nine files; each file may occupy any number of volumes, but a single-tape volume cannot contain more than one file.
- Input, output, and intermediate storage files may be assigned on the IBM 2400-Series Magnetic Tape Unit, the IBM 2311 Disk Storage Drive, or the IBM 2314 Direct Access Storage Facility.
- Without the use of the user exits, the organization of the input files must be sequential.
- Intermediate storage may be on a maximum of ten tape drives (if the alternate work option is used) or eight extents on up to eight direct-access devices.
- The sort program has exits to allow the processing of user-written routines. At these exits, the user-written routines may write or check labels, open or close files, take checkpoints, insert, modify, or delete records, read the input file, write the output file, or process I/O errors.
- When input and intermediate storage are on direct-access devices, the output may optionally consist of record addresses instead of the records themselves. The output may also include control fields.
- The sort program will process null files.
- The sort program will process multivolume unlabeled tape files.

The specifications of the merge program are:

- Input to a merge may be fixed-length or variable-length, blocked or unblocked records. All records for a given merge must have the same format, although different blocking factors are allowed.
- The input and output files may be assigned on the IBM 2400-Series Magnetic Tape Unit, the IBM 2311 Disk Storage Drive, or the IBM 2314 Direct Access Storage Facility.
- A maximum of eight input files may be merged.
- The organization of the input files must be sequential.
- The control fields of the input files must be in sequence
- The merge program has exits to allow the processing of user written routines. At these exits, the user-written routines may write or check labels, open or close files, insert, modify, or delete records, write the output file, or process I/O errors.

PROGRAMMING SYSTEMS - Written in IBM System/360 Assembler Language with the macro language facility. This program is designed to operate with the latest level of the Disk Operating System (DOS) and all subsequent releases, unless stated otherwise in a revision of this document.

MINIMUM SYSTEM CONFIGURATION - In addition to the minimum DOS configuration described in the publication "IBM System/360 Disk Operating System: System Control and System Service Programs", GC24-5036, the following machine configuration is required:

- A minimum partition of 10K for any merge-only application or for sorting applications using the IBM 2311 Disk Storage Drive or IBM 2400-Series Magnetic Tape Units as intermediate storage.
- A minimum partition of 22K for sorting applications using the IBM 2314 Direct Access Storage Facility for intermediate storage.
- One IBM 2311 Disk Storage Drive or one IBM 2314 Direct Access Storage Facility attached to one selector channel for system residence. (If direct-access devices are used in a sorting appplication for input, output and intermediate storage, additional direct-access devices may be required).
- One IBM 1403, 1404, or 1443 Printer, or one IBM 1052 Printer-Keyboard. (A tape unit or direct access device may be used as the SYSLT device).
- One IBM 1442, 2501, 2520, or 2540 Card Reader, or one IBM 2400-Series Magnetic Tape Unit (7- Or 9-track), or one IBM 2311 Disk Storage Drive, or one IBM 2314 Direct Access Storage Facility, assigned to SYSIPT and SYSRDR.
- Three IBM 2400-Series Magnetic Tape Units for intermediate storage if tape units are to be used as work files.

BASIC MATERIAL
Unlicensed Documentation: One copy each of IBM/360 Disk Operating System, Tape and Disk Sort/Merge Program, System Information Manual, Program Product Specification Sheet, IBM System/360 Disk Operating System Tape and Disk Sort/Merge Program General Information Manual.

Licensed Machine Readable: Object Program Load Modules

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and Sample Problems.

Refer to local IBM Branch Office for ordering instructions.

5736-T21 *N

TARIFF PUBLISHING SYSTEM (BOUND TARIFFS)

DESCRIPTION - The Tariff Publishing System provides the publishers of bound freight tariffs with a computerized technique for the conversion, publication, and maintenance of tariffs. It offers composition efficiencies and provides the capability to produce tariffs in machine-processable (magnetic tape), as well as printed form. The tariff data is prepared on an IBM 1050 Data Communication System, according to the formats defined in the IBM Tariff Publishing System Data Preparation Manual. The punched card output from the IBM 1050 System becomes the input to the Tariff Publishing System.

- Produces camera-ready tariffs conforming to industry specifications relative to page size, type size, and the arrangement of characters and graphics.
- Records tariffs on magnetic tape (1600 bpi) in machine-processable format.
- Meets the standards adopted by the railroad industry for data representation in their tariffs, such as abbreviations, codes, and formats. A special 135-character print train, which has been customized to satisfy the requirements of various regulatory agencies, is available.
- Processes the wide range of data formats which are found in typical tariffs and converts them to magnetic tape.
- Creates and maintains the interest profile used by the Traffic Profile Analysis System (5736-T22), as well as print the selected rate items.

PROGRAMMING SYSTEMS - The Tariff Publishing System operates under DOS/360 and uses the following features of DOS--Direct Access Method... Consecutive Disk and Tape IOCS... Indexed Sequential File Management System... Groups 1 and 2 Utilities - Unit Record/Disk and Tape... MPS Utility Macros... Disk Sort/Merge or Tape/Disk Sort/Merge. This program product is released to work with DOS Release 21 and subsequent releases, versions, and modifications unless so stated in a future revision of this document. The application programs are written in Assembler (F) Language.

MINIMUM SYSTEM CONFIGURATION - A System/360 Model 25 (32K) with Decimal Arithmetic feature... 1052 System Console... any valid DOS/360 SYSPIT device for input of tariff transactions... three 2400 Series Magnetic Tape Units for storage of tariff master files... one 2311 Disk Storage Drive in addition to DOS/360 requirements... one 1403 Printer equipped with Universal Character Set Adapter and Wide Hammer (RPQ W15658)... one 1416 Interchangeable Train Cartridge with Special Tariff Character Set (RPQ M43828)... necessary control units with these I/O devices. For the IBM 1050 Data Communication System the 1051 Control unit with the Automatic EOB feature... one 1052 Printer-Keyboard with Automatic EOB, Accelerated Carrier Return, and a Dual Case Print Element... one 1058 Printing Card Punch with an Operator Panel. It is recommended that the first IBM 1050 System in an installation be equipped with one 1056 Card Reader.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Data Preparation Manual, the Program Description/Operations Manual, the Tariff Format and Standard Codes Manual, Program Product Specifications.

Licensed Machine Readable: Object program modules and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of Systems Manual.

Licensed Machine Readable: Source program modules.

Refer to local IBM Branch Office for ordering instructions.

5736-T22 *N

TRAFFIC PROFILE ANALYSIS SYSTEM (POINT-TO-POINT TARIFF ITEM SELECTION)

DESCRIPTION - The Traffic Profile Analysis System provides a computerized method to enable shippers, carriers, and other users of the magnetic tape tariffs supplied by the tariff publishing agents to select and analyze rate items based on a profile of user interests. The IBM 1050 Data Communications System is used to prepare punched cards containing profile information relating to the commodities a tariff user ships and the points which are of interest. The profile data cards are then processed by the Tariff

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Publishing System (5736-T21) to create a user interest profile on tape. All maintenance activity to this profile is performed by the Tariff Publishing System. Once the profile has been built, it is ready for processing by the Traffic Profile Analysis System. The program selects the rate items that meet the user's search criteria, and the output is written onto a magnetic tape for further processing. The Tariff Publishing System may now be used to print the selected rate items, or these items may be used as input to further computer analysis of there user's own design.

- Selects rate items of interest to the user from the Tariff Publishing System magnetic tape tariffs distributed by the publishing agents.
- Provides customized tariffs as defined by the user's interest profile.
- Prints the selected rate items in the same format as the original tariff issue.

A prerequisite for the use of the Traffic Profile Analysis System is the Tariff Publishing System (program number 5736-T21).

PROGRAMMING SYSTEMS - The Traffic Profile Analysis System operates under DOS/360 and uses the following features of DOS--Direct Access Method... Consecutive Disk and Tape IOCS... Index Sequential File Management System... Group 1 and 2 Utilities - Unit Record/Disk and Tape... MPS Utility Macros... Disk Sort/Merge or Tape/Disk Sort/Merge... This program product is released to work with DOS Release 21 and subsequent releases, versions and modifications unless so stated in a future revision of this document... The application programs are written in Assembler (F) Language.

MINIMUM SYSTEM CONFIGURATION - A System/360 Model 25 (32K) with Decimal Arithmetic Feature... 1052 System Console... any valid DOS/360 SYSIPT device for input of profile transaction... four 2400 Series Magnetic Tape Units... one 2311 Disk Storage Drive in addition to DOS/360 requirements... one 1403 Printer equipped with Universal Character Set Feature and Wide Hammer (RPQ W15658)... one 1416 Interchangeable Train Cartridge with Special Tariff Character Set (RPQ M43828)... necessary control units with these I/O devices. For the IBM 1050 Data Communication System Figuration: One 1051 Control Unit with the Automatic EOB feature... one 1052 Printer-Keyboard with Automatic EOB, Accelerated Carrier return and a Dual Case Print Element... one 1058 Printing Card Punch with an Operator Panel. It is recommended that the first IBM 1050 System in an installation be equipped with one 1056 Card Reader.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description/Operations Manual... Program Product Specifications.

Licensed Machine Readable: Traffic Profile Analysis System object program modules and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: Systems Manual.

Licensed Machine Readable: Traffic Profile Analysis System Source program modules.

Refer to local IBM Branch Office for ordering instructions.

5736-UT1 *N
THE 1288 BASIC UNFORMATTED READ SYSTEM

DESCRIPTION - The 1288 Basic Unformated Read System program is designed to assist you in entering data from the IBM 1288 Optical Page Reader, Model 1. It uses the ability of the 1288 to read unformatted, typed documents. The data contained on the documents is read, edited, and written on one of two sequential output files.

Editing information for constructing the ouput records is entered into the data capture program through the 1288 on a header document along with the following types of information:

- Coordinates to be used in reading data documents.
- A batch ID for user identification purposes.
- The maximum number of lines used to include one input record.
- The maximum number of fields per input record.
- The serial and record number option to be used, if any.
- Whether short input records are to be processed.

The editing information entered describes the individual fields in the output records.

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Two output files are produced by the program:

- EDTGOOD
- EDITBAD

EDTGOOD contains all the valid records in the batch. EDITBAD contains invalid records from the batch with error messages explaining the errors found for each record. EDITBAD also contains a batch statistic table which contains the following general types of information:

- The number of each type of error encountered.
- The number of records written on each output file.
- The number of documents routed to each stacker on the 1288.

The data capture program also provides for an optional error exit routine to be provided by the user. This routine may be used to further inspect each valid record for errors which are not detected by the program.

PROGRAMMING SYSTEMS - This program is designed to be executed under the Disk Operating System with either BATCH or Multiple Program Support (MPS) design. It is designed to be operated with DOS Release 21 and all subsequent releases, versions, and modifications unless so stated in a future revision of the this document.

The program uses the Logical Input/Output Control System (LIOCS).

MINIMUM SYSTEM CONFIGURATION - The minimum configuration required for the installation and execution of the data capture program includes:

- IBM System/360 configuration supporting the Disk Operating System which has at least 24K bytes of core storage. (This program requires no more than 16K bytes of core storage.)
- IBM 1288 Optical Page Reader, Model 1.
- IBM 2400 Series Tape Drive (one for each file to be written on tape.)
- IBM 2311 Disk Storage Drive or IBM 2314 Direct Access Storage Facility (if files are to be written on disk.)
- IBM 1052 Printer-Keyboard.

BASIC MATERIAL
Unlicensed Documentation: Basic Program Material List... IBM System/360 DOS... Specification sheet.

Licensed Machine Readable: 1288 Basic Unformatted Read System.

Refer to local IBM Branch Office for ordering instructions.

5736-U11 *N
CUSTOMER INFORMATION CONTROL SYSTEM

DESCRIPTION - The IBM Customer Information Control System is a general purpose data base, data communication interface between Operating System/360 and user-written application programs. The system which is distributed as Assembler Language Source and Macro Libraries, provides the user with the facilities to generate a system configuration applicable to his needs, to define the environment in which the system is to execute and a macro facility through which to communicate application program service requests.

Functions necessary to support a data base, data communication system plus functions required to support other standard terminal applications (such as message switching, data collections, and order distribution) are provided by the Customer Information Control System through the following management facilities:

- Task Management - provides multitasking facilities necessary for concurrent transaction processing. Other required functions satisfied by this important program include priority scheduling, transaction synchronization, and serially reusable facility control.
- Storage Management - provides the control of main storage. Storage acquisition, disposition, initialization, and request queuing are among the services and functions performed by this essential component of the system.
- Program Management - provides a multiprogramming capability through dynamic program management while offering a program fetch capability as well as OS/360 fetch protection.
- Terminal Management - provides polling under user specified line traffic control as well as user requested

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reading and writing. This facility supports automatic task initiation to process new transactions. The testing of application programs is accommodated by the simulation of terminals through sequential devices such as card readers, line printers, disk, tape, etc.

- File Management - provides a data base facility using Operating System/360 direct access and indexed sequential data management. This function supplies support for symbolic storage (updates and additions) and selective retrieval of logical file data.

- Transient Data Management - provides the optional queuing facility for the management of data in transit to and from user defined destinations. This function has been included to facilitate the implementation of message switching, data collection, and logging.

- Temporary Storage Management - provides the optional general purpose "scratch pad" facility. The facility is intended for video display paging, broadcasting, data collection suspension, conservation of main storage, and retention of control information, etc.

In addition to the management functions described, the Customer Information Control System provides the following system service programs:

- Sign On/Sign Off - provides the means of terminal operation identification (security).

- Master Terminal Function - provides dynamic user control system. It is through this facility that the master terminal operator can change the status and values of data used by the control system and thereby alter the operation of the system.

- Supervisory Terminal Function - performs the same services as the Master Terminal except they are limited to terminals under a given supervisor's jurisdiction.

- System Statistics - provides the ability to dynamically display system statistics.

- System Termination - allows the user to close the system down by gathering summary statistics, closing data sets, and returning control to OS/360.

PROGRAMMING SYSTEMS - The Customer Information Control System is written in OS/360 Assembler Language and operates under the control of OS/360. It requires the following OS/360 control program options -- Multiple Wait... Interval Timing... Resident SPIE... SER1... Graphic Programming Services (if 2260 Display Station is attached locally)... Input/Output support for applicable access methods such as Index Sequential Access Method, Basic Direct Access Method, Basic Telecommunications Access Method with the Communication Serviceability Features.

The Customer Information Control System may be used with the OS/360 Primary Control Program (PCP) if the only terminals on the system are the locally attached 2260 Display Stations. One of the OS/360 configurations, Multiprogramming with a Fixed number of Tasks (MFT) or Multiprogramming with a Variable number of Tasks (MVT), must be used in support of any system that includes other terminals. The selection of PCP, MFT or MVT, is the user's responsibility. The control system operates within one partition of MFT or as one task within one region of MVT.

User-written programs are to directly communicate with the control system via a combination of its macro instructions and Assembly Language instructions.

MINIMUM SYSTEM CONFIGURATION - The configuration requirements are similar to those necessary to support the OS/360. The direct access storage devices to contain the application data sets and the terminal configurations necessary to support the new application are the only additional devices required.

The minimum machine configuration includes a 2040 (or larger) Processing Unit Model G for the OS/360 PCP configuration with only locally attached 2260 Display Stations, the OS/360 MFT or MVT configurations with all other terminals. The Decimal Arithmetic, Storage Protection is a desirable feature on PCP, MVT, and MVT OS/360. Appropriate I/O units to satisfy the OS/360 requirements for system console, system input, system output, system residence, and system data sets... and sufficient direct access storage devices, either 2311 Disk Storage Drives, 2321 Data Cell Drives, or 2314 Direct Access Storage facilities (or all three) to satisfy customer information storage requirements. (The 2841 Storage Control must have the record overflow feature). The Customer Information Control System will be distributed on magnetic tape only. A 2400 Series Tape Drive (9- or 7-track with Data Conversion feature) must be available for program distribution and maintenance.

The minimum system may have all terminals (features which are not mentioned are not supported) of a single type or combination of:

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2260 Display Station (local attachment of remote attachment on non-switched lines) with optionally -- Alphameric Keyboard (#4766) or Number Keyboard (#4767), through a 2848 Display Control Model 1, 2, or 3 with the following optional features -- Line Addressing (#4787) and/or Non-destructive Cursor (#5340) and Non-destructive Cursor Adapter (#5341) and/or 1053 Adapter (#7927, 7928) and 1053 Printer Model 4.

1050 Data Communication System (on non-switched lines) with optionally -- Alphameric Keyboard (#4766) through a 2845 Display Control with the following optional features -- Destructive Cursor (#3301) and/or Line Addressing (#4801, 4802) and/or 1053 Adapter (#7927, 7928) and 1053 Printer Model 4.

2740 Communication Terminal Model 1 (one non-switched lines) with the following optional features -- Record Checking (#6114) and/or Station Control (#7479), 2740 Communication Terminal Model 2 (on non-switched lines) with Record Checking (#6114) which is optional.

Common Carrier Teletypewriter Exchange (TWX) Stations Model 33/35 Type with 8-level codes at 110 bps on Common Carrier Switched 160 Baud networks.

The appropriate line adapters and telecommunication control units must be included in the configuration. The Auto Poll feature (#1319) on the 2702 Transmission Control or the standard auto poll feature on the 2703 is supported for the non-switched lines with the 1050 Data Communication System and the 2740 Communication Terminal with the Station Control Feature.
The access methods of OS/360 are used by the Customer Information Control System in communication with devices on the system. Consequently, the control system only operates with devices supported by OS/360.

The minimum core storage requirements stated below for the Customer Information Control System exclude the following core storage areas: the fixed core storage requirements for the OS/360 configuration, the core storage for the necessary OS/360 Access Methods, the input/output areas, and user processing programs. The basic control system modules require up to 15,000 bytes of core storage. The tables and areas used with the system are variable and dependent on the user's requirements. An example of a system supporting 50 hard copy terminals, three file data sets, 100 program, 50 transaction types, and 50 queues would require approximately 20,000 bytes for the tables and work areas.

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual... Application Description Manual... System Manual.

Licensed Machine Readable: Two OS/360 partitioned data sets.

Refer to local IBM Branch Office for ordering instructions.

5736-U12 *N

POWER SYSTEM PLANNING PROGRAM

DESCRIPTION - Using the Power System Planning (PSP) Program Product, the electrical planning engineer can obtain solutions to electrical network problems.

PSP provides, through the Engineering Data Management Service (EDMS), programs to validate, organize, load and retrieve electrical power systems data for use by three simulation programs. These three programs simulate steady state line flows and station conditions (Power Flow), three-phase and single-phase line-to-ground faults (Short Circuit), and transient analysis of synchronous machine swings during predicted electrical system disturbances (Transient Stability).

Once information regarding a particular network has been correctly formatted and entered into the EDMS master data bank, base case studies or change case studies may be conducted on an electrical network. This is accomplished by entering control information indicating the network configuration to be studied and the simulation program to be imposed upon that network. The specified network is then retrieved from the master data bank, subjected to the study and results both printed and stored on a direct access file for future use.

Engineering Data Management Service (EDMS) loads, validates, updates, and maintains a common data bank for the three electrical network simulation programs. Initially, it checks data for reasonableness, validates and loads this data into the data bank and, when the simulation is required, retrieves the pertinent data. Significant features are: reasonability checks... disk/printer utilities... one data set for each device type... change case function for ease of network modification... audit trail of additions or changes to the master data bank... automatic numbering of buses.

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Power Flow of component PSP produces the results of a steady state performance calculation on an electrical power network under load. These results specifically include real and reactive power flows in transmission networks and tielines as well as complex voltages throughout the network. The use of Newton-Raphson solution technique provides the advantages of ease of solution for large networks and direct representation of circuit elements. Significant features of the Power Flow component are: Newton-Raphson solution technique... automatic transformer tap changing... exception reporting capability... automatic interchange control... optional tolerance limits... load tap changing limits... representation of bus tie breakers.

Short Circuit component of PSP calculates the three-phase and line-to-ground fault conditions of electrical transmission networks. Significant features are: automatic sequencing (ranking)... provision for changing of network characteristics... Z matrix method (driving point and transfer impedance)... open circuit analysis... line end analysis.

Transient Stability component of PSP is used to study turbine-generator behavior during and shortly after electrical system disturbance. The Transient Stability component simulates specified system disturbances and determines new system voltages and synchronous machine swings. Significant features are: classical or refined generator representation... direct solution of network equations... saturation effect on generators... IEEE excitation system models... speed governor model... swing curve... case restart with new switching schedule.

PROGRAMMING SYSTEMS - PSP is written in PL/1 and operates under the control of Operating System/360, PCP (Primary Control Program), or MFT (Multiprogramming with a fixed number of tasks). PSP uses the basic direct access method (EDAM), index sequential access method (BISAM and QISAM), and queued sequential access method (QSAM).

MINIMUM SYSTEM CONFIGURATION - The minimum machine configuration for PSP is dependent upon the components used and the size of problems to be solved. In addition to satisfying OS/360 machine requirements, the PSP System/360 must provide for maximum simulation capacity, core storage partition sizes as described in the table below, decimal and floating point arithmetic, two 2311 Disk Storage Drives and for the printing of the system output (a printer with 132 print positions). One optional 2400 series magnetic tape unit is recommended for backup and results file storage. A 2400 series magnetic tape unit (9-track or 7-track with Data Conversion feature) must be available for program distribution and maintenance.

Based on a maximum problem capacity of 1,000 buses (700 for Transient Stability), the partition size and DASD requirements (the DASD requirements specify the number of cylinders of a 1316 Disk Pack) are:

		DASD Requirements			
PSP Component	Partiton Size	Load Module Library	Work Space (temp.)	Results File	Master Data Bank
EDMS File Load & Val.	130K	20	9		31
EDMS Retr.	130K	20	7		31
EDMS Maint.	145K	30	5		31
Power Flow	195K	30	19	5	31
Short Circuit	190K	49	12	3	31
Transient Stability	220K	15	25	5	31

A 196K System/360 with 150K available core storage is required to run just EDMS or a Power Flow Simulation with a network of up to approximately 600 buses. A 256K System/360 is required for operation of Short Circuit, 1,000 bus Power Flow simulation, or a 700 bus Transient Stability simulation.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: Object instructions, link edit control.

RELATED OPTIONAL MATERIAL
Licensed Documentation: Engineering Data Management Service System Manual... Short Circuit System Manual... Power Flow System Manual... Transient Stability System Manual.

Licensed Machine Readable: Source code and procedure flowcharts.

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Refer to local IBM Branch Office for ordering instructions.

5736-XM1 *N
APL/360-DOS

DESCRIPTION - The APL language provides the problem-solver, be he engineer or programmer, scientist or salesman, with an improved means for setting down the steps he believes will yield a satisfactory solution. The availability of an APL terminal system gives him immediate access, at his demand, to a facility that will accept his statement of a solution, translate it at once into a computer program and execute on demand the program he has specified. This enables him to rapidly determine the adequacy of his solution. In the event that his output indicates a flaw in his logic, the APL system gives him the capability of entering corrections at once and then having his amended solution put to the test.

Features - APL Language - easy to learn... extremely flexible - applicable to simple or complex problems... completely computer independent... simple, uniform syntax... precise... concise... more than forty pre-defined operations (called 'functions')... powerful array-handling capability... ability for each individual user to create and preserve a virtually limitless number of functions of his own definition, which he can then use in precisely the same way as the functions that are predefined... use of familiar symbols for the ordinary arithmetic operations.

APL Terminal System - ability to share programs among some or all of the members of an installation... automatic preservation of work interrupted by communication failures... free-form decimal output... powerful program-editing facility... ability to save work for prolonged periods... a comprehensive set of utility programs to facilitate user-library management... effective debugging capabilities... automatic internal conversions of data representation with full double-precision arithmetic (16 decimal digits) when required... rapid response... a library structure built around workspaces that hold both programs and data... an immediate execution (desk calculator) mode completely free of irrelevant keywords... a comprehensive, integrated set of system commands for managing workspaces and libraries, and for other essential functions... three levels of security; account numbers, workspaces, and programs can be individually locked against use or display... visual fidelity between hard copy and transmitted entries to ensure reproducibility of results... succinct diagnostic reports... ability to guarantee the other jobs running concurrently with APL 360 a specified proportion of CPU time.

PROGRAMMING SYSTEMS - APL 360-DOS is written in the DOS/360 Assembler Language and requires no further coding by the system user. NOTE: When APL 360-DOS is installed, the Multitasking Feature of DOS cannot be used.

MINIMUM SYSTEM CONFIGURATION - The minimum central processor needed to run APL under Disk Operating System/360 is a System/360 Model 2040GF. APL 360-DOS requires a partition the minimum size of which is approximately 128K bytes. This figure is based on maintaining two 20K workspaces core-resident. The number of terminals that can be supported with reasonable response in a region of this size is dependent on many factors. Extrapolation from simulation results and experience on a 2050I indicates that approximately ten terminals can be serviced satisfactorily under the most restrictive conditions. Enlarging the region by allocating additional core to make three or four workspaces resident tends to increase (but at a decreasing rate) the number of terminals that can be serviced. The program product also enables the generation of a dedicated APL system that will run in a Model 2040G.

In addition to the devices required to run DOS/360, the following are needed: one 2311 Disk Storage Drive or one 2314 Direct Access Storage Facility module; one 2702 or 2703 Transmission Control; one 2702/3 subchannel address; one 2741 Telecommunications Terminal or one 1050 Data Communication System containing at least one 1052 Printer-Keyboard, one 2400 Series 9-track Magnetic Tape unit.

BASIC MATERIAL
Unlicensed Documentation: APL/360-DOS Operations Manual... APL/360-DOS System Generation Manual... APL/360 Users Manual.

Licensed Machine Readable: Relocatable modules, macro definitions, and distributed workspaces.

RELATED OPTIONAL MATERIAL
Licensed Documentation: Microfiche assembly listings.

Refer to local IBM Branch Office for ordering instructions.

5736-XP2 *N
RESOURCE ALLOCATION FOR PROJECT CONTROL SYSTEM/360 (REAL/360)

DESCRIPTION - The IBM System/360 Resource Allocation for Project Control System/360 (REAL/360) program aids in providing efficient resource utilization by rescheduling the output of PCS/360 (360A-CP-06X) to meet resource constraints. It handles PERT/CPM or PRECEDENCE networks, up to 52 networks simultaneously, up to 5,000 activities, several different calendars, fixed-time or fixed resource scheduling, up to 20 resources, variable availability levels, up to four resources per activity, and alternative resources.

PROGRAMMING SYSTEMS - REAL/360 is written in Assembler and Basic FORTRAN IV and operates under control of DOS/360.

MINIMUM SYSTEM CONFIGURATION - A 64K 2030 (or 2040, etc.) Processing Unit with 4427 Floating Point feature and a 2311 Direct Access Storage Device are required for REAL/360. The 1442 or 2540 Card Read Punch, the 1403 Printer, the 1052 Console, and the two other 2311 DASD also needed by REAL/360 are those required by PCS/360. REAL/360 uses a 53K byte partition.

This program operates on System/360 and compatible System/370 configurations, subject to the compatibility constraints announced for System/370.

BASIC MATERIAL
Unlicensed Documentation: Program Product Specifications. .. Program Description and Operations Manual.

Licensed Machine Readable: Relocatable program modules and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Licensed Machine Readable: Source listings and flowcharts.

Refer to local IBM Branch Office for ordering instructions.

5736-XS1 *N
GENERAL PURPOSE SIMULATION SYSTEM/360 (DOS)

DESCRIPTION - GPSS/360 Version 2 is an easy - to - understand tool for modeling and examining the behavior of systems in the engineering and management science areas. Many applications of a complex logical and procedure oriented nature which ordinarily defy mathematical description can be easily described and studied using GPSS. Varying environments may be simply introduced to enable the user to explore alternatives and identify capacity limitations. Both environment and activities may have random variations. Proposed changes to existing policies, methods, and operations can be subjected to critical performance criteria and evaluated. The user may also investigate and judge the value of new proposals without costly capital investments and without disturbing existing operations.

GPSS/360 Version 2 provides significant advantages over GPSS/360 Version 1. Major functions and capabilities of GPSS/360 Version 2 are:

- Complete compatibility with GPSS/360 Version 1.
- A real-time TIMER for model interruption and continuation.
- An easy-to-use interface between GPSS/360 and independently compiled FORTRAN routines.
- An execution time core resident PRINT/TRACE/HELP feature.

Version 2 of GPSS/360 also provides a number of user convenience and model enhancement features. Among these are additional SNA's for the absolute clock and terminations-to-go, an optical procedure for bypassing the often redundant second (absolute) input listing, and improved diagnostic capabilities.

The adaptability of GPSS/360 Version 2 is enhanced by provision for GPSS/360 data sets on 2314 direct access storage devices.
PROGRAMMING SYSTEMS - The GPSS/360 Version 2 program is written completely in Assembler language and operates under control of DOS/360. GPSS/360 has three standard entity allocations built into the program; however, any or all entities may be tailored to particular model needs by use of the GPSS/360 Reallocate feature. The following shows the approximate minimum storage requirement for each of the three standard entity allocations: A (52K), B (96K), and C (170K).

These figures include the main storage required for the GPSS/360 program, tables, control words, entities, and COMMON. The ability of the user to specify the required number of each entity type through use of the Reallocate feature provides great flexibility in adapting the core requirements of GPSS/360 to partitions which are smaller,

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between, or larger than the figures mentioned above. Understandably, the use of GPSS/360 optional features such as Jobtapes, SAVE/READ,HELP routines, and core resident PRINT/TRACE/HELP feature during execution will increase the main storage required.

MINIMUM SYSTEM CONFIGURATION - The minimum system requirements for DOS GPSS/360 Version 2 are similar to those necessary to support the DOS/360. No additional devices should be required. The minimum machine configuration includes a 2030 Processing Unit Model F with 64K bytes of main storage and the Universal Instruction Set. The system input unit may be a 1442, 2501,2520, or 2540 Card Reader Punch, or 2400 Series Tape Unit; the system output unit may be a 1403, 1404, 1443, 1445 Printer, or 2400 Series Tape Unit. GPSS/360 resides in the system core image library and may utilize the direct access (2311 or 2314) space allocated to system units for its primary data sets during execution. Series 2400 Tape Unit(s) will be required if optional GPSS/360 features are employed. The Interval Timer Feature will be necessary if the GPSS/360 Run Length Feature is used. The GPSS/360 program will be distributed on magnetic tape only. A 2400 Series Tape Unit (9- or 7-track with Data Conversion feature) must be available for program distribution and maintenance.

BASIC MATERIAL
Unlicensed Documentation: Introductory User's Manual... User's Manual... Operator's Manual.

Licensed Machine Readable: Object code and sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Licensed Machine Readable: Source program card decks.

Refer to local IBM Branch Office for ordering instructions.

5736-XS2 *N
DATA/360-DOS

DESCRIPTION - The IBM System/360 on-line data entry system (DATA/360-DOS) enhances the capability of the Disk Operating System and facilitates the implementation of source code entry, data file creation, and data editing. The environment accommodates both DATA/360-DOS and conventional batch processing operations concurrently or separately.

The DATA/360 system:

- Accomplishes most of the functions provided by the IBM 29 Card Punches and 59 Card Verifiers.
- Provides generalized editing to improve the quality of data initially entered. Only data passing the edit specifications is accepted and placed on disk.
- Provides a means for upgrading procedures to DATA/360-DOS with no need to alter existing entry documents.
- Provides format control for up to 16 fields.
- Provides operator and production statistics.
- Has ordered 64-character set (see An Ordered 64-Character Set below.)

An Ordered 64-Character Set:

26 alphabetic characters
10 numerical characters
25 special symbols (includes space and new line symbols)
3 control symbols: cursor, check and start manual input

DATA/360-DOS consists of two major divisions--the DATA/360-DOS on-line program and the DATA/360 file utility programs.

The on-line program provides a method of entering data from a variable number of local IBM 2260 Display Stations (see Minimum System Configuration) to a direct access storage device and verifying this data to produce input to a user's program, bypassing all unit record operations.

Utility programs include:

- A File Load program to create and define new files.
- A File Extract program to extract data from the master file, place the data on a sequential disk or tape output file, and generate a report of the current status of batches in the master file.
- A File Transfer program to copy active data into a newly loaded master file from a file previously maintained by the DATA/360-DOS system.
- A File Analysis program to give the user extensive information about the DATA/360-DOS master file.

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PROGRAMMING SYSTEMS DATA/360-DOS operates under the Disk Operating System/360 and is written in Assembler Language. Indexed Sequential Access Method, Basic Teleprocessing Access Method, and Sequential Access-Work Files are the data management and access methods used.

MINIMUM SYSTEM CONFIGURATION - System/360 Model 30 (65K) with Interval Timer (4760) and Decimal Arithmetic (3237)... Disk Storage Unit (2314 or 2311)... 2848 Model 3, 21, or 22 Control Unit... Non-Destructive Cursor (5340)... 1 to 24 2260 Model 2 Display Stations (240 characters), 1 to 16 2260 Model 2 Display Stations (480 characters), or 1 to 8 2260 Display Stations (960 characters), 1 to 12 Cursor Adapters (5341)... 1 to 12 Display Adapters (3368)... 1 to 24 Alphameric-Numeric Inset (4765) for 2260 Model 2 terminals only. Estimated core partition size for DATA/360-DOS is 26K resident plus 600 bytes/terminal.

BASIC MATERIAL
Unlicensed Documentation: Terminal Operator's Guide... Console Operator's Guide... System Manual.

Licensed Machine Readable: Source code and sample problem.

Refer to local IBM Branch Office for ordering instructions.

5736-XX2 *N
CFO AUTOCODER TO ASSEMBLER LANGUAGE INSTRUCTION SET TRANSLATOR (CATALIST)

DESCRIPTION - The IBM CFO Autocoder to Assembler Language Instruction Set Translator (CATALIST) is a language conversion aid program to translate the IBM '62 CFO 1401 Autocoder source programs to System/360 Assembler Language source programs. All standard 1401 Autocoder instructions and instructions for tape, card read/punch, and printer I/O devices are processed. The index register, high-low-equal compare, multiply-divide, sense switch, store-address register, and expanded print edit special features of the 1401 are also supported. Translation of 1401 IOCS macros is not supported.

The generated Assembler Language program has the following characteristics:

1. The original 1401 Autocoder comments and labels are retained.
2. Core storage layouts for data are exactly as they would have appeared in the 1401.
3. All CATALIST generated statement labels begin with $ for easy recognition and unique identification.
4. I/O and editing subroutines produce the same results as would have been obtained on the 1401.
5. Within the field size constraints of System/360, arithmetic subroutines produce the same results as would have been obtained on the 1401.
6. Wordmarks used as switches and variable-position data delimiters are, whenever possible, simulated at execution time through the use of psuedc-wordmarks generated into the Assembler Language program.
7. Modification of A and B operand equivalents of 1401 instructions is accomplished, whenever possible, through the generation and utilization of address constants in the Assembler Language program.
8. Chaining of all single character instructions and most multiple-character instructions is handled.

Highly readable output provides the user with the information and diagnostics needed to verify, correct, or implement portions of the program requiring programmer evaluation.

The CATALIST object code may be ordered according to the user's core storage size (64K, 128K, or 256K) in relocatable object code form. As a special feature, the PL/1 source coding is available. For this feature, the user will need the PL/1 compiler.

PROGRAMMING SYSTEMS - CATALIST operates under DOS/360. While the program is written entirely in PL/1, the PL/1 compiler is not required to generate the CATALIST system as all the modules required for execution are distributed in object form. This program product is released to work with DOS Release 21 and all subsequent releases, versions, and modifications unless so stated in a future revision of this document.

MINIMUM SYSTEM CONFIGURATION - 2030F Processing Unit (64K) with at least 52K bytes available for program, data, and access method storage with Decimal Arithmetic (3237), Storage Protection (7520), Interval Timer (4760) Selector Channel (6960), 1051 Attachment (7915)... 1051 Control Unit Model N1 with CPU Attachment (3130), Systems Console Attachment (9708), First Punch (4410), First Reader (4411) and First Printer (4409) Attachments controlling one 1052 Printer-Keyboard Model 8... 2841 Storage Control... 2311 Disk Storage Drive... 2803 Magnetic Tape Control Unit Model 1... two 2401 Magnetic Tape Units Model 1... 2821 Control Unit... 1403 Printer Model 2... 2540 Card Read Punch Model 1.

CONTINUED FROM PRIOR COLUMN

BASIC MATERIAL
Unlicensed Documentation: One copy of the Program Description and Operations Manual... Program Product Specifications.

Licensed Machine Readable: CATALIST relocatable object modules -- sample problem. The user may order a 64K Version, a 128K Version, or a 256K Version depending on his requirement.

Licensed Machine Readable: CATALIST PL/1 source decks.

Refer to local IBM Branch Office for ordering instructions.

5736-XX3 *N
SYSTEM/360 LEARN ATS-DOS

DESCRIPTION - LEARN ATS-DOS assists in the learning of the System/360 Administrative Terminal System command language for its use in source data entry, file maintenance, and text processing applications. The program is designed primarily for people with no prior ATS terminal operations knowledge. The training program operates concurrently with, and in the same partition as the DOS Version of ATS/360. This announced version of LEARN ATS operates only with Version 1 Modification Level 2 or ATS/360-DOS.

LEARN ATS-DOS is made up of three major components:

1. Additional and modified macros and application programs for accessing the program at the terminal.
2. Eight lessons which present the instruction and are ATS/360 special Permanent Storage Documents. The contents of which cannot be altered or changed.
3. A student textbook which is used as an integral part of the education process.

PROGRAMMING SYSTEM - The System/360 LEARN ATS-DOS program is written in System/360 Assembler Language. It consists of new and modified application programs and macros incorporated into ATS/360-DOS.

The ATS/360-DOS program is written in DOS/360 Assembler Language and operates under control of a DOS/360 version which provides a multiprogramming capability. The DOS/360 version uses the console interrupt key to call for the cessation of ATS/360 peripheral functions. Therefore, background programs that use this key or console operator-initiated messages may not run while ATS/360 is running.

MINIMUM SYSTEM CONFIGURATION - The System/360 LEARN ATS-DOS program runs under control of the DOS version of ATS/360 and therefore requires the same system configuration. LEARN ATS adds approximately 300 bytes of core storage to the ATS/360 DOS supervisor. Four new LEARN ATS-DOS application programs are stored in the ATS application residence area and will require approximately five tracks on an IBM 2311 Disk Storage Drive or four tracks on an IBM 2314 Direct Access Storage Facility. A maximum of 60 application programs are allowed in ATS/360-DOS.

The basic machine components used for ATS/360-DOS consist of a Model F Processing Unit (64K bytes), one Selector Channel, 1052 Printer-Keyboard with appropriate attachment... 2841 Control Unit with two 2311 Disk Storage Drives, or one 2314 Direct Access Storage Facility... One 2702 Transmission Control Unit or one 2701 Data Adapter Unit or one 2703 Transmission Control Unit, 2741 Communications Terminals equipped only with Standard Courier 72 SELECTRIC printing element (Feature 9812... part 1157043), and appropriate line adapters. ATS/360-DOS supports only the Correspondence Code 2741 Terminals without the interrupt feature. These components are in addition to DOS/360 requirements of one 2311 Disk Storage Drive, one card reader, one card punch and one printer. This minimum configuration could preclude some ATS/360 document transmission functions depending upon selection of I/O devices. One 2400 magnetic tape drive is required for system generation.

In practice it is recommended that a user include sufficient components to obtain maximum benefits and performance for ATS/360. Additional components supported include multiple 2311 Disk Storage Drives, up to two 2314 Direct Access Storage Facilities... one or more 2400 Magnetic Tape Drives with tape control units, card punch, and printer (producing at least 132-character print lines).

If the multiprogramming feature of DOS/360 is used, the Storage Protect feature is required on the processing unit. If upper and lower case high-speed printing is desired, a 1403 Printer Model 2,3,or N1 equipped with the Universal Character Set feature and the TN printing arrangement must be used. The print quality of the 1403 can be improved and made to approximate that of the 2741 by the use of the special 'Courier' characters. The quality may be further improved by special 'wide hammers' on the printer. The wide hammers are RPQ items. For further information see System/360 Administrative Terminal System - DOS

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Application Description Manual (GH20-5010).

ATS/360 does not in general require exclusive use of any particular channel. ATS/360 I/O devices are channel independent to the extent of physical attachment. For example, several 2311s may be assigned to separate control units on each of two selector channels if desired; furthermore, programs in other partitions may share channels with ATS/360-DOS operations. However, if programs in other partitions require a selector channel, for best ATS/360 performance it is recommended that a second selector channel be added -- one dedicated to ATS/360-DOS functions and the other to background programs. Further, to avoid interference problems which might occur in some configurations, it is recommended that burst mode devices not be attached to the multiplexer channel.

BASIC MATERIAL
Unlicensed Documentation: One copy each of the Program Description Manual, the Workbook, and Program Product Specifications.

Licensed Machine Readable: Source modules and changes for four macros and eight application programs, and eight lessons in archive format.

RELATED OPTIONAL MATERIAL
Licensed Documentation: One copy of System Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-XX4 *N
DATA BASE ORGANIZATION AND MAINTENANCE PROCESSOR

DESCRIPTION - The Data Base Organization and Maintenance Processor is based on a direct access file-oriented concept that separates data into recurring and nonrecurring classes.

Master files contain nonrecurring data. The records of a master file are organized and maintained in logical sequence of record identifiers (keys). They may be accessed in logical sequence, by identifier through an index, by disk location, or by consecutive location sequence. Two physical organization alternatives are provided; one is especially suited to volatile files.

Chain files contain recurring data, organized in variable-length lists of related fixed-length records. Each list is associated with a record in a master file. A chain record may belong to more than one list, thereby constituting a list intersection which in effect cross-references master records. User information which is unique to the intersection is stored in the chain record.

PROGRAMMING SYSTEMS - The IBM System/360 Disk Operating System is used as the control system for the Data Base Organization and Maintenance Processor. The following components of DOS are used:

System Control and Basic IOCS	360N-CL-453
Direct Access Method IOCS Macros	360N-IO-454
Assembler Basic Modules	360N-AS-465
Unit Record and Disk Utilities Group 1	360N-UT-461
Disk/Tape Sort/Merge	360N-SM-483

In addition to the above DOS/360 components, the following IBM System/360 modules may be employed at the user's option:

COBOL	360N-CB-452
PL/1	360N-PL-464
Consecutive Tape Input/Output Control System Macros	360N-IO-456

The Data Base Organization and Maintenance Processor is written in Assembler Language. The programs can be customized to run on a minimum configuration with a DOS/360 supervisor of 8K bytes. User application programs may be written in Assembler Language, COBOL, or PL/1.

MINIMUM SYSTEM CONFIGURATION

Device or Feature	For S/360 Mdl 25	For S/360 Mdl 30
System/360 Central Processing Unit, 32K bytes	2025E	2030E
Decimal Arithmetic Special Feature	standard	3237
Control Unit for 1052 Printer-Keyboard	------	1051 N1
Console Printer-Keyboard	1052 Mdl 7	1052 Mdl 8
Card Reader/Punch (see Note 1)	2540	Any
Printer	1403	Any with at least 120 print positions
Storage Control	-----	2841 Mdl 1
Disk Storage Drives (see Note 2)	2311 Mdl 1	2311 Mdl1
OR		
Direct Access Storage Facility (see Note 2)	-----	2314-A series

CONTINUED FROM PRIOR COLUMN

BASIC MATERIAL
Unlicensed Documentation: Program Description Manual... Operations Manual... Program Product Specifications.

Licensed Machine Readable: Source code plus special utility programs and a sample problem.

RELATED OPTIONAL MATERIAL
Licensed Documentation: System Manual.

Refer to local IBM Branch Office for ordering instructions.

5736-H12
SHARED LABORATORY INFORMATION SYSTEM (SLIS) *N

DESCRIPTION - The IBM Shared Laboratory Information System (SLIS) provides data processing support for hosptial clinical laboratories. Operating with the Disk Operating System (DOS) and the Shared Hospital Accounting System (SHAS) executive, the programs handle batched input of laboratory requisitions and test results, producing reports for use throughout the hospital. The system produces a full complement of laboratory working documents, ward reports, cumulative summary reports, and statistical reports.

The program design allows tailoring of formats and procedures to meet the separate needs of several hospitals sharing a common computer. Both shared and non-shared users can make use of the SLIS adaptability features. Also each user can receive reports in a format tailored to his particular specifications.

Input and output of the system may optionally use the SHAS teleprocessing executive allowing remote data entry and report production. The laboratory application programs complement the SHAS accounting applications through the use of common admission procedure and automatic charge generation.

PROGRAMMING SYSTEMS - The SLIS application programs are written in DOS COBOL and Assembly language. Also used are the executive facilities and census subsystem of SHAS, the DOS Sort/Merge, and the DOS Utility programs. Current releases of DOS and SHAS (360A-UH-11X) are required.

MINIMUM MACHINE CONFIGURATION - For non-teleprocessing systems, the minimum DOS COBOL system... E Processing Unit (32K)... two Magnetic Tape Units and Control... three 2311 Disk Storage Drives Model 1 are required for running the sample problem. Background application programs require 22K (K=1024 bytes) of the appropriate model.

For teleprocessing systems, the minimum DOS QTAM multiprogramming system with interval timer (feature 4760) including requirements for non-teleprocessing systems, specified above.

BASIC MATEERIAL
Unlicensed Documentation: Program Product Specification Sheet... Program Description Manual... Operations Manual.. Laboratory... System Manual.

Licensed Machine Readable: Source program modules... job control cards... catalogued descriptions... sample problem.

Refer to local IBM Branch Office for ordering instructions.

CONTINUED FROM PRIOR COLUMN

360A-CM-03X *M
SCIENTIFIC SUBROUTINE PACKAGE

DESCRIPTION - Scientific Subroutine Package consists of a collection of FORTRAN subroutines, input-output free, which can be combined with a users input, output or computational routines to meet his individual requirements. The primary purpose of this package is to make available a basic mathematical and statistical subroutine library to aid the user in the development of his own FORTRAN subroutine library. The user may supplement or modify the collection to meet his needs. The library includes a wide variety of subroutines to perform the functions listed below. There is no intent to imply that these subroutines represent the current "state of the art" in Statistics or Numerical Analysis. However, they should be useful in solving the more commonly encountered problems in engineering and science. Most of the new subroutines are available in both single and double precision. Individual subroutines, or combinations of them, can be used to carry out -

Statistics -- Analysis of Variance (factorial design)... Correlation Analysis... Multiple Linear Regression... Polynomial Regression... Canonical Correlation... Factor Analysis (principal components, VARIMAX)... Discriminant Analysis (many groups)... Time Series Analysis... Data screening and analysis... Nonparametric tests... Random Number Generation (uniform, normal).

Mathematics -- Inversion... eigenvalues and vectors (real symmetric case)... simultaneous linear algebraic equations... transpositions... matrix arithmetic (addition, product, etc.)... matrix partitioning... matrix tabulation and sorting of rows or columns... elementary operations on rows or columns of matrices... matrix factorization... integration of given or tabulated functions... solution of systems of first-order differential equations... Fourier analysis of given or tabulated functions... Bessel and modified Bessel function evaluation... Gamma function evaluation... Jacobian elliptic functions... elliptic, exponential, sine cosine, Fresnel integrals... finding real roots of a given function... finding real and complex roots of a real polynomial... polynomial arithmetic (addition, division, etc.)... polynomial evaluation, integration, differentiation... Chebyshev, Hermite, Laguerre, Legendre polynomials... minimum of a function... approximation, interpolation and table construction... permutations... differentiation.

FEATURES - All subroutines are free of input/output statements... subroutines do not contain permanent maximum dimensions for the data arrays named in their calling sequence... all subroutines are written in FORTRAN... all subroutines are documented uniformly.

PROGRAMMING SYSTEMS - The Scientific Subroutine Package has been developed using System/360 Basic Programming Support FORTRAN Compiler (Tape). However, the subroutines of SSP/360 should compile and execute with any System/360 FORTRAN compiler capable of accepting basic programming support FORTRAN statements.

MINIMUM SYSTEM REQUIREMENTS - A System/360 configuration suitable for the FORTRAN compiler chosen. The machine configuration required for any given problem depends on the number of subroutines used, the size of the compiled subroutine, the size of the compiled main program, the size of the control program, and the data storage requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Programmer's Manual, H20-0205.
MACHINE READABLE - Source code and sample problem source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ACM03X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-CM-05X *M
MATLAN MATrix LANguage)

DESCRIPTION - MATLAN is a general purpose program for matrix manipulation and computation. It consists of a language processor, which accepts and translates statements written in the problem-oriented MATLAN language; and execution program, which performs the actual computations as specified by the user's statements. The large number and wide range of the statements in the MATLAN language provide a flexible tool for expressing and solving the many problems in which matrix techniques are used such as aircraft structure... network analysis... bridge design... marine engineering... structural frame analysis.

FEATURES -
- The language is problem-oriented; therefore, it is easy to learn, use, and remember.
- Matrices are identified and referenced by user-assigned names may be written with scalar subscripts.
- Allocation of storage is performed automatically and dynamically. Segmenting algorithms are used if the storage requirements of the matrices exceed available core size.
- Matrix elements are automatically stored in coordinate form or in array form, according to the degree of sparseness.
- Matrix elements may be real or complex numbers and may be expressed in single or double precision.
- The precision of computation may be selected at execution time. No recompilation is required to run the same problem with higher precision.
- All matrix dimensions are defined at execution time and need not appear in the MATLAN language source program.
- Attributes may be assigned to matrices both for checking purposes and for selecting efficient processing algorithms in special cases.
- An extensive error-checking system provides error messages and simplifies program debugging.
- Subprograms written in either the MATLAN language or in FORTRAN IV may be called by the main program.

USE - MATLAN is easy to use. The use of the MATLAN language is similar to the use of any high-level, problem-oriented languages. The user need only state his problem in the MATLAN language, append his data and submit the program for processing.

PROGRAMMING SYSTEMS - MATLAN operates under the IBM System/360 Operating System. The subroutines are written in FORTRAN IV, H-Level, and Operating System Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - MATLAN may be used on any IBM System/360 Model 40, 50, 65, 75, or 85 equipped at least with the following devices: Central Processor with 128K bytes of core storage, the Universal Instruction Set and the Interval Timer... two 2311 Disk Storage Drives or other random access storage of same or higher storage capacity (except the 2321 Data Cell Drive) which is supported by Operating System/360... one input device (card reader, magnetic tape, DASDI)... one output device (printer, magnetic tape, DASD).

In addition to installation requirements for the options of OS/360 selected, MATLAN requires a minimum of 59K bytes of storage, not including data area. For installation of MATLAN one disk drive not used for OS residence is required.

To use some MATLAN features efficiently (checkpoint/restart procedure, reorganization of direct access device), the use of magnetic tapes is recommended instead of direct access devices. To install the MATLAN system, a magnetic tape unit is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description (H20-0564)... Operations Manual (H20-0559).
MACHINE READABLE - Consists of three MATLAN partitioned data sets with the following contents - A library of all separately compiled and link-edited components of MATLAN in non-executable form... Linkage editor control for generation of executable modules... Sample problems.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Consists of three MATLAN partitioned data sets with the following contents - Input for DOS/360 Flowchart Program to generate MATLAN subroutine flowcharts... Macros necessary to generate LOAD from SOURCE... Source modules of the system.

ORDERING INFORMATION: PROGRAM NUMBER 360ACM05X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		DTR 9/1600	29	none
		MT 7DC/800	26	01

360A-CM-07X
SYSTEM/360 SCIENTIFIC SUBROUTINE PACKAGE FOR PL/I

DESCRIPTION - SSP makes available in the PL/I language

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a powerful computational ability for the scientist and engineer. It provides the PL/I user with most of the basic capabilities which were provided to the FORTRAN user in earlier versions of SSP/360.

This package provides a basic mathematical and statistical subroutine or procedure library. The library includes a wide variety of subroutines which perform the following functions:

MATHEMATICS - Matrix operations (elementary, linear equations, eigenvalues)...polynomial operations (orthogonal polynomials, polynomial economization, polynomial roots)...numerical quadrature (tabulated functions, non-tabulated functions)... numerical differentiation (tabulated functions, non-tabulated functions)... interpolation... approximation... smoothing... roots & extrema... ordinary differntial equations... special functions.

STATISTICS - Data screening & analysis...elementary statistics...correlation & regression (correlation, multiple linear regression, stepwise multiple regression, canonical correlation)...analysis of variance...discriminant analysis...principal components analysis...non-parametric statistics...distribution functions.

FEATURES -
- All subroutines are free of input/output statements.
- All subroutines are written in OS/360 PL/I (F).
- Most of the subroutines provide a double-precision option
- The use of certain subroutines (or groups of them) is illustrated in the program documentation by sample main programs with input/output.
- All subroutines are documented uniformly.

USE - The user may incorporate any subroutine from the SSP PL/I package in his own PL/I procedure CALL statement, just as he does with his own subroutines.

PROGRAMMING SYSTEMS - The subroutines are written in the PL/I language using the 48-character set and the facilities provided by the PL/I (F) compiler, which functions under Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - A minimum requirement is a System/360 suitable for the OS/360 PL/I(F) compiler. The storage capacity for any given problem depends upon the number of subroutines used, the size of the compiled subroutines, the size of the compiled main program, the size of the control program, and the data storage requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description and Operations Manual (H20-0586). The Program Description and Operations Manual combines the material which would normally be presented in the the Program Description Manual, the Operations Manual, and the Systems Manual.
MACHINE READABLE - PL/I source statements for all subroutines and sample problem source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ACM07X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360A-CN-08X *M
S/360 AUTOSPOT NUMERICAL CONTROL PROCESSOR

DESCRIPTION - This processor is designed to implement computer preparation of input to machine tool controllers for point-to-point operations and simple milling operations. Significant time savings can be realized when this technique is used in place of tedious manual methods.

AUTOSPOT operates as a task under control of DOS/360, accepts either BCDIC or EBCDIC input on any sequential system input device, and allows any number of input decks (part programs) to be processed in a single job step.

The AUTOSPOT processor accepts an English-like language defining geometric entities, patterns of points, desired motion sequences and machining information. This input, called a part program, is converted to a meta-language containing mathematical representations of the geometric surfaces and sequential instructions directing a cutting device with respect to defined surfaces and points. The processor will then analytically calculate points on the cutting device axis at the tip (bottom center) of the device. The resultant motion will always be linear motions.

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The AUTOSPOT processor also allows the optical interpretation of point-to-point machining verbs and eliminates the burdensome task previously required of a user-written post processor program. These data are then available to a user supplied post processor which must insure that they conform to the characteristics and dynamics of a particular N/C device.

FEATURES - The processor includes extensive pattern definition and manipulative capabilities, scalar variables, nested definitions, FORTRAN-like arithmetic computational facilities, geometric definitions, sophisticated editing functions and the generation of cutter motions required to perform simple milling operations. The AUTOSPOT processor establishes a precedent in that a wide range of machining verbs may optionally be interpreted. This capability substantially reduces the complexity of the user-supplied post processor required to produce the final input to a machine tool/controller.

PROGRAMMING SYSTEMS - The processor is written in System/360 Assembly Language and operates under the Disk Operating System (6K Supervisor). The processor requires approximately 25K of core exclusive of the DCS Supervisor.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Model E with Floating Point Arithmetic (No. 4427), 1051 Attachment (No. 7915), 1051 Control Unit (Model N1), First Printer Attachment (No. 4409), First Punch Attachment (No. 4410), First Reader Attachment (No. 4411), CPU Attachment (No. 3130), 1052 Printer-Keyboard (Model 6), 2501 Card Reader (Model N1),

1442 Card Punch (Model N2), 1443 Printer (Model N1), 2841 Storage Control, 2311 Disk Storage Drive. NOTE - If a 2030 Model F or large processing unit is available, significant performance increases will be realized with the use of the AD-APT/AUTOSPOT (360A-CN-09X).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Part Programming Manual, H20-0373...Operators Manual, H20-0374.
MACHINE READABLE - Object modules, control cards and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source programs and flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ACN08X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01

360A-CN-09X *M
S/360 AD-APT/AUTOSPOT

DESCRIPTION - AD-APT/AUTOSPOT operates as a task under control of DOS/360, accepts either BCDIC or EBCDIC input on any sequential system input device, and allows any number of input decks (part programs) to be processed in a single job step.

The AD-APT/AUTOSPOT Processor accepts an English-like language defining geometric entities, patterns of points, desired motion sequences and machining information. This input, called a part program, is converted to a meta-language containing mathematical representations of the geometric surfaces and sequential instructions directing a cutting device with respect to defined surfaces and points. The processor will then analytically or iteratively calculate points on the cutting device axis at the tip (bottom center) of the device. The resultant motion will always be linear motions whose magnitudes are dictated by specified tolerance criteria. These points are then available to a user-supplied postprocessor which must insure that they conform to the characteristics and dynamics of a particular N/C device.

The user is supplied with a printed listing of the part program and optionally a printed listing of the cutter center points and machining information. He must also specify which postprocessors are to be called to process the output of the AD-APT/AUTOSPOT Processor.

FEATURES - The AD-APT/AUTOSPOT Processor is the first sophisticated numerical control processor which effectively addresses itself to the requirements of both point-to-point and contouring machine tool users, yet operates on a small computing system. It is designed to process the AUTOSPOT Language and the AD-APT Language, or any mixture of the two languages in any one part program, without sacrifice in processing speed. The processor is substantially faster

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than the 1620/1311 AE-APT Processor. The AD-APT numerical control language provides contouring capabilities involving constant cutter contact with vertical surfaces of many shapes and nonvertical planes. In addition, very sophisticated macro and loop capabilities are provided for repeating with variations a set of predefined operations. The processor also encompasses a very extensive set of geometric definitions, FORTRAN-like computational facilities and comprehensive editing functions.

PROGRAMMING SYSTEMS - The AD-APT/AUTOSPOT Processor is written in its entirety in DOS Assembler Language. The input/output routines are written in physical IOCS. The minimum DOS configuration required to operate AD-APT/AUTOSPOT includes the DOS Assembly Language program and the DOS utilities. AD-APT/AUTOSPOT users must order the System/360 Disk Operating System separately.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Processing Unit Model F with with Floating Point Arithmetic (No. 4427), 1051 Attachment (No. 7915), 1051 Control Unit (Model N1) with First Printer Attachment (No. 4409), First Punch Attachment (No. 4410), First Reader Attachment (No. 4411), CPU Attachment (No. 3130), 1052 Printer-Keyboard (Model 6), 2501 Reader (Model B1), 1442 Punch (Model N2), 1443 Printer (Model N1), 2841 Storage Control, 2311 Disk File Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... AD-APT/AUTOSPOT Part Programming Manual, H20-0375...AUTOSPOT Part Programming Manual, H20-0373...Operators Manual, H20-0374.
MACHINE READABLE - Relocatable object modules and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source programs and flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ACN09X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		DTR 9/1600	29	none
		MT 7DC/800	26	01

360A-CN-10X *M
APT NUMERICAL CONTROL

DESCRIPTION - This processor operates as a task under control of OS/360. The APT processor accepts either BCD or EBCDIC input on any sequential system input device and allows any number of input decks (part programs) to be processed in a single job step. The APT processor accepts an English-like language defining geometric shapes, desired motion sequences, and machining information. This input, called a part program, is converted to a meta-language containing mathematical representations of the geometric surfaces and sequential instructions directing the movement of a cutting device with respect to the defined surfaces. The processor will then analytically or iteratively calculate points on the cutting device axis at the tip of the device (bottom center of the cutting device). The resultant motions will always be straight line motions whose length is determined by specified tolerance criteria. These points are then available to a user-supplied post processor which must insure that they conform to the characteristics and dynamics of a particular N/C device.

The APT processor is also capable of modifying the cutter axis to conform to part program specifications. When the processor is in a multi-axis (4 or 5 axis) environment, the output data will also contain the unit vector representing the cutter axis for each output point.

FEATURES -
- Double precision calculations are used throughout the processor to improve reliability and extend the range of usable numbers.
- An analytical processing technique calculates start-up positions and non-iterative solutions for motion sequences involving vertical planes or cylinders for drive and check surfaces and non-vertical planes for part surfaces. This technique significantly reduces the processing time for these cases.
- The data handling technique for the POCKET feature has been designed to provide efficient usage of work files.
- An internal statement number is assigned by the processor and referenced by output listings and error messages.
- A debugging facility has been included in the processor to assist computer programmers in locating problem areas.
- The level of nesting allowed for MACRO's is five.

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The number of MACRO variables allowed is 50.
- The storage requirements for resident tables are predetermined and the space dynamically allocated to reduce the requirement for programmer manipulation.
- Reliability of the processor, particularly ARELEM is the primary design criterion.
- Dummy call structures are provided to assist with interfacing of special user programs.
- The redefinition of variable symbols as another surface of the same type without the inclusion of the CANON modifier in the surface definition is permitted via a modal CANON/ON - CANON/OFF command.
- The core storage requirements for each MACRO are printed.
- Post processors are created as separate load modules and may be added or modified without re-link editing other post processors or any other component of the APT system.
- A tool axis specification and algorithm have been implemented to provide predictable multi-axis results.
- A feature to allow selective printing of the output data.
- Pattern definition and manipulation capability to facilitate point-to-point programming.
- Capability for punching surfaces and scalar values into cards.
- System macro capability to allow commonly used macros to be defined once and subsequently be available to any input part program.
- Segment Read feature, which allows segments of part programs to be stored on direct access devices and subsequently read in and include in input part programs.
- Implicit subscripting for simplified part coding and improved processor performance.
- Improved Pocketing capability in that the part surface plane may optionally be used as the bottom of the pocket.
- Virtual elimination of arithmetic element loops by addition of code to detect and exit from loop conditions.

PROGRAMMING SYSTEMS - The APT processor routines are primarily written in FORTRAN H. The APT input/output routines are written in OS/360 Assembly Language and interface to the BSAM access method. The minimum OS configuration to operate APT includes the OS Assembly Language program, the FORTRAN H compiler, the 44K E-level linkage editor, and the OS utility programs.

MINIMUM SYSTEM REQUIREMENTS - Operating System/360 requirements...Floating Point Arithmetic...approximately 215K bytes of core storage. Executable load modules require 1.2 million bytes of direct access storage (310 2311 disk tracks). Additional storage is normally required for user-implemented post processor load modules. Work space for intermediate storage must be available on one or more 2311, 2302, or 2314 Disk Storage Device...2301 or 2303 Drum Storage Drive...2400 Tape Unit. The amount of intermediate storage required is a function of the part program executed. Intermediate storage requirements generally vary from a total of .3 million bytes to 2 million bytes. At the installations where SPT is a significant application, to meet normal thruput requirements, consider: a Model 2050H with Floating Point Arithmetic (#4427)...one 2400 series Tape Drive...four 2311 Disk Drives...2540 Card Read Punch...1012 Attachment Device (RPQ)...1012 Tape Punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Part Programming Manual, H20-0309... Operator Manual, H20-0331...Application Directory.
MACHINE READABLE - Source programs, executable load modules, overlay structures, and sample part programs.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ACN10X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360A-CN-12X
SYSTEM/360 AD-APT/AUTOSPOT (OS) NUMERICAL CONTROL PROCESSOR

DESCRIPTION - AD-APT/AUTOSPOT is a bilingual processor which prepares numerical instructions for both point-to-point and contouring machine tools.

The AD-APT/AUTOSPOT Processor addresses itself effectively to the requirements of both point-to-point and contouring machine users, yet operates on a medium scale computing system. It is designed to process the AUTOSPOT language and the AD-APT language, or any mixture of the two languages in any one part program, without sacrifice in processing

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speed. The AD-APT/AUTOSPOT Processor provides contouring capabilities involving constant cutter contact with vertical surfaces of many shapes and non-vertical plane part surfaces. In addition, sophisticated macro and loop capabilities are provided for repeating with variation a set of predefined operations. The processor also encompasses an extensive set of geometric and pattern definition and manipulative capabilities, scalar variables, nested definitions, FORTRAN-like computational facilities, and sophisticated editing functions.

FEATURES -
- Both the AUTOSPOT and AD-APT languages may be processed in the same part program.
- Long operand floating point calculations are used throughout the processor to improve reliability and extend the range of usable numbers.
- A processor assigned statement number is referenced in output listings and diagnostic messages.
- The number of MACRO variables allowed is 50. The level of MACRO nesting allowed is five.
- The number of vocabulary synonyms allowed is 50.
- Looping capabilities are implemented using the LCOPST/LOOPND feature of APT.
- The output file (CLFILE) may be edited by using TRACUT and/or COPY instructions.
- Debugging facilities are included to aid part programmers in locating problem areas.
- Extensive FORTRAN-like computational facilities are included.
- An extensive set of geometric and pattern definition and manipulative capability is included. The pattern capability is a significant subset of that contained in S/360 APT.
- A wide range of AUTOSPOT machining verbs may be interpreted by the processor.
- Any number of part programs may be processed in a single job step.
- Postprocessor input/output modules, completely compatible with those of S/360 APT, are provided for ease in implementation of FORTRAN-coded postprocessors.
- A system library concept permits accessing externally defined part program segments, such as a master TOOL or MACRO library.
- A significant subset of S/360 APT pattern definition and manipulative capability enhances the facility of point-to-point part programming.
- A thickness (THICK) statement may be applied to surfaces used in AD-APT contouring operations.
- The redefinition of variable symbols equivalenced to nonscalar entities is controlled via a modal CANCN/CN-CANON/OFF statement.
- The capacity of the RESERV table accommodates 100 unique array names.
- New computational functions are included.
- The XYONLY mode of AUTOSPOT may be suppressed via the modal command XYONLY/OFF.
- AUTOSPOT constants, used in verb interpretation, may be modified via the modal command UNIT/u.

USE - The AD-APT/AUTOSPOT Processor accepts an English-like language defining geometric entities, patterns of points, desired motion sequences and machining information. This input, called a part program, is converted into a meta-language containing mathematical representations of the geometric entities and sequential instructions directing a cutting device with respect to specified surfaces and points.

The processor then calculates either analytically or iteratively, points on the cutting device axis, such that the linear motions generated thereby are optimized with respect to the specified tolerance criteria.

Further, a wide range of AUTOSPOT machining verbs may optionally be interpreted by the processor, thus greatly reducing the tasks required of a postprocessor.

These data are then available for subsequent processing by a user-supplied postprocessor program, which must insure that they conform to the characteristics and the dynamics of a particular N/C device.

The user is supplied with a printed listing of the part program, and optionally a printed listing of the cutter enter points and machining information. He must also specify which postprocessors are to be executed to process the output of AD-APT/AUTOSPOT.

PROGRAMMING SYSTEMS - The AD-APT/AUTOSPOT Numerical Control Processor is written primarily in Assembler Language. It operates as a task under control of OS/360. It requires the F level assembler and E level linkage editor and uses the SYS1.MACLIB and SYS1.FORTLIB libraries. The AD-APT/AUTOSPOT Processor may be executed in a normal job step environment. The processor is designed to reside on a direct access device in executable form, and need only be scheduled as a job operating under OS/360.

MINIMUM SYSTEM REQUIREMENTS - In addition to OS/360 requirements, this program requires the Floating Point Arithmetic feature and 100K of core. Distribution of the program will be by magnetic tape only. Systems without

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tape drives may be used to execute the program if other provisions are made to load the program to a disk storage device.

The program requires the equivalent of 15 cylinders of 2311 storage on a disk storage device. In addition, space must be available on a second disk storage device for intermediate storage. The amount of intermediate storage required is dependent on the input data.

An example of a configuration which could be used for this program is a 2040G...2540 Card Read Punch...1403 Printer... two 2311 Disk Storage Drives...one 2400 Magnetic Tape drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Part Programming Manual (H20-0549)...Operations Manual (H20-0557).
MACHINE READABLE - Executable load modules, postprocessor overlay structure and sample part programs.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Flowcharts and source program modules, and is specified by using Program Number Extension OPT1. Option 2 - Flowcharts, and is specified by using Program Number Extension OPT2. Option 3 - Listings, and is specified by using Program Number Extension OPT3.

ORDERING INFORMATION: PROGRAM NUMBER 360ACN12X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
OPTIONAL	OPT1	MT	9/1600	29	01
		MT	9/800	28	01
	OPT2	MT	7DC/800	26	01
	OPT3	MT	7DC/800	26	01

360A-CO-14X *M

MATHEMATICAL PROGRAMMING SYSTEM LINEAR PROGRAMMING CAPABILITY

DESCRIPTION - MPS combines the best features of current IBM linear programming systems plus significant new capabilities such as -

- Separable Programming - A mathematical programming technique for the solution of models containing certain types of non-linear variables within a normal linear programming framework.
- A dynamic storage allocation algorithm to utilize the System/360 memory and input/output devices most efficiently during problem solution.
- "PROBLEMS" - A new procedure which lists the names and identifying information of all problems on a problem file.
- An improved inversion technique which improves accuracy and reduces solution time.
- A maximum problem size of 8,191 rows.
- Maximum problem size is 8,191 rows

PROGRAMMING SYSTEMS - OS/360, Release 18. MPS/360 is written of resources (capital, raw materials, manpower, etc.), to specified activities (investments, products, jobs) to obtain a particular objective (minimum expense, maximum profit) when there are alternate uses for these resources. Linear programming plays an important role in such areas as materials allocation, ingredient blending (feed, flour, gasoline, etc.), production scheduling, distribution, and shipping. This programming system operates under control of the IBM Operating System/360. It consists of a number of routines called procedures, stored on the Program Library Residence device of Operating System/360. Only those procedures currently being executed are brought into main storage. The particular procedures to be executed are under the supervision of a control program prepared by the user. This control program is composed of statements which specify to the system the desired procedures to be executed. The sequence of these statements defines a solution strategy for solving a particular linear programming problem.

FEATURES -

- The system utilizes the Revised Simplex Method (product form of inverse) with bounded variables and range constraints.
- A highly efficient inversion technique using a triangularization method permits inversions to be made frequently, thus increasing the speed of succeeding iterations and maintaining a high degree of accuracy.
- A multiple pricing method, adjusted for problem size and amount of available storage, reduces the amount of file

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processing and increases solution speed.
- Dynamic storage allocation provides for maximum utilization of available System/360 components.
- Maximum problem size is 4,095 rows.
- Conditional control statements permit alternate solution strategies to be implemented depending upon the conditions which arise during solution.
- Interrupt facilities provide the means for pre-planning alternate strategies in the event of off-normal conditions.
- Simultaneous parametric programming on both the righthand side and objective function may be utilized.
- Parametric programming on matrix rows or columns.
- Modular design makes it easy to add, modify, replace or delete functions as new requirements develop.
- Provision for converting input data from the 7040/44, 1620 - 1311, and 1400 - 1311 Linear Programming Systems is provided.
- FORTRAN interface to implement procedures in FORTRAN and integrate them under control of MPS/360.
- Separable programming which allows the inclusion of certain types of non-linear variables into a linear programming model.

PROGRAMMING SYSTEMS - OS/360, Release 7. MPS/360 is written in the OS/360 Assembler Language. It uses the BSAM and EXCP Data Access methods of OS/360.

MINIMUM SYSTEM REQUIREMENTS - MPS/360 requires a S/360 with at least 65,536 bytes, the Standard and Decimal Instruction Sets, the Floating Point option, and, if the system output is a printer, it must have 132 print positions (a minimum of 44K bytes must be available for MPS/360 program and data storage). This version of MPS/360 supports the 2400 Series Magnetic Tape Units (Models 1 through 6), the 2311 Disk Storage Drive, the 2302, 2303, 2314 Direct Access Storage Devices and the 2301 Drum Storage Device.

The problem size (number of rows) which MPS/360 solves is directly dependent upon the size of memory available for data. The total amount of core storage used by MPS/360 is divided into two parts, program storage and data storage. The size of the MPS/360 program is approximately 29,800 bytes with a slight variation because of the number and type of I/O devices used to solve a given problem. The amount of storage available for data varies depending on the following factors -

- S/360 CPU size.
- Size of resident OS/360.
- In a multi-task operating system, the size of core currently being used by other tasks.
- The user-specified amount of data core available to MPS/360 for the current run.

The design of MPS/360 allows the user to solve problems much larger than the designed norm, but with a reduction of efficiency. This conscious design goal of the system allows the user to solve "in house" those few problems which exceed his normal requirements. However, it is recommended that the System/360 CPU size be selected using the designed norm problem size rather than the maximum problem size. The number of data storage bytes available to MPS/360 may be obtained by subtracting from the S/360 CPU size -

- Size of resident OS/360.
- Amount of core, if any, being currently used by other tasks.
- 29,800 (approximate program size of MPS/360).

Figure 1 represents the maximum and the designed norm problem size which may be solved with the indicated number of data bytes. The Application Description Manual (H20-0136) provides the equations necessary to evaluate the maximum problem for a given number of data bytes. MPS/360 requires a minimum number of utility files for the permanent and temporary storage of data. However, if available and specified by the user, the system will utilize a set of optional files to provide additional flexibility or more efficient problem solution. A file is a collection of related data stored and retrieved in a sequential fashion. A file may be stored on a part of a direct access device (2311) or a single reel of tape. Figure 2 contains the files required by MPS/360. Note the system input, output, punch and system residence file have been excluded from this table. Figure 3 contains the optional files which if present will be utilized by MPS/360.

FIGURE 1

Rows/Bytes	17,300	82,500	213,000	475,000	992,000
*Maximum *	305	2,120 *	4,095 *	4,095 *	4,095
*Norm *	Equal to 200	700 *	1600 *	3500 *	or Equal to 4095

"Designed Norm" is the problem size MPS/360 was designed to solve normally on the specified number of data bytes.

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FIGURE 2

*FILE NAME *	DESCRIPTION
*SYSMLCP (1)	*Contains machine language control producted by compiler.
*MATRIX1 (3)	*Contains, in internal form, the LP matrix.
*ETA1 (2)	*Contains, in internal form,product form of inverse.
*SCRATCH1 (3)	*Used for temporary data storage.
*SCRATCH2 (3)	*Used for temporary data storage.
*PROBFILE (2)	*Contains a machine independent representation of LP model.

FIGURE 3

*FILE NAME *	DESCRIPTION
*OLDPFILE (2)	*Contains a machine independent representation of problem which is to be revised or copied.
*MATRIX2-4 (3)	*Up to 4 devices may be specified for storage of the LP model (they should be on separate channels).
*ETA 2-4 (2)	*Up to 4 devices may be specified for storage of product form of the inverse (should be on separate channels).
*MPSCRAT (1)	*Used by the post-optimal procedures when only 4 work regions (minimum) have been setup.
*SYSABS	*A high-speed printer which may be used to monitor the LP solution.

(1) Must be a direct access device.
(2) If 2400 Series Tape Unit, it must be 9-track.
(3) If 2400 Series Tape Unit and 7-track, it must have the Data Conversion feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory - Users Manual, H20-0290... Linear and Separable Programming User's Manual, H20-0476... Readcomm Program Reference Manual, H20-0372.
MACHINE READABLE - Relocatable load modules, message descriptions and sample problem deck.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ACO14X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		DTR 9/1600	29	none
		MT 7DC/800	26	01

360A-CC-15X *M

MARVEL/360

DESCRIPTION - MARVEL is a language processor which facilitates the data preparation and output analysis functions associated with the Mathematical Programming System/360 (360A-CO-14X). The user may write a MARVEL program to generate a linear programming input matrix for MPS/360, analyze an MPS/360 solution, and produce data on an external file pertaining to this solution, or generate a management report from an MPS/360 solution. MARVEL operates under the control of MPS/360 and is called with the MPS Procedure Call statement.

FEATURES - Elements referenced by row and column name... automatic array overflow onto a DASD when memory is exceeded... easy retrieval of MPS/360 data... transfer of program control based on intermediate results. The MARVEL language operates on arrays or tables of data, but is unique in that it references the elements of arrays by row and column name rather than numerical subscripts. The arrays to be used are first defined and input data is read into them. The data records may contain the array, row, and column names into which the data element is to

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be stored; thus, there is no need for any particular ordering. The MARVEL program may contain arithmetic or logic statements required to perform the desired data transformation for output. Results may be filed on work files or output files, and previously filed data may be retrieved. Format specifications are required only for initial input and final output; intermediate results are filed automatically in a common format.

PROGRAMMING SYSTEMS - MARVEL is written in the Basic Assembler Language and operates under OS/360. It uses BSAM and EXCP data access methods.

MINIMUM SYSTEM REQUIREMENTS - MARVEL requires a S/360 with 128K bytes of storage, the Universal Instruction Set, and, if the systems output device is a printer, it must have 132 print positions. Program storage requirements, including access methods, for the two configurations are - 61K bytes for the 128K configuratien and 128K for the 256K and above configuration. Additional memory (minimum of 5K) is used for array storage. MARVEL supports two configurations - the 128K configuration and the 256K and above configuration. MARVEL performs best on the 256K and above configuration; the 128K configuration is approximately half the speed of the 256K configuration.

The follcwing table lists the files used by MARVEL. These files may be stored on a 2314, 2311 DASD, or a 2400 Series Magnetic Tape Unit. Note that the OS/360 input, output, and residence devices are not included in this table.

File Name	Description	Notes
OBJ	Contains object program prcduced by MARVEL preprocessor.	Required
CALC1&CALC2	Used by CALCULATE statement when memory is exceeded.	Optional
OVERFLCW	Contains arrays which cannot be maintained in memory.	Optional - Must be DASD.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Primer Manual, H20-0496... Program Description Manual, H20-0505... Operations Manual H20-0512.
MACHINE READABLE - Appropriate Material Delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Material List.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360ACO15X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	01
OPTIONAL	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01

360A-CO-18X *M
LINEAR PROGRAMMING SYSTEM/360 (LPS/360)

DESCRIPTION - Provides the System/360 DOS user with a simple, easy to understand, easy to use means of solving linear programming problems.

Mathematic optimization is any mathematical technique for determining the optimum use of various resources - capital, raw materials, manpower, plant, or other facilities - to attain a particular objective such as minimum cost or maximum profit, when there are alternate uses for the resources. Linear Programming is the most widely used of these techniques and has been used to allocate, assign, schedule, select, or evaluate the uses of limited resources for such jcbs as blending, mixing, cutting, trimming, bidding, pricing, purchasing, planning, and the transportation and distribution of raw materials and finished products.

LPS/360 processes up to 200 row problems on a 32K System/360 and up to 1500 row problems on a 64K and larger System/360s.

The number of columns is limited only by the amount of disk space available.

FEATURES - Large problem capacity (1500 rows on a 64K System and 2000 rows on a 32K system)...simple flexible processing control (optional conditional control of processing sequence)...simple problem definition (easy-to-use format and extensive data maintenance functions, specification of starting solution basis, combination of problems to form master problems)...advanced mathematical methods - automatic iterative input scaling for accuracy, revised simplex method (product form of inverse), problem description and to increase problem capacity and solution speed... multiple pricing...efficient triangularization

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inversion method for accuracy...extensive post-optimal analysis options (discrete parametric analysis for all problem data and activity-cost-bound relationships for all variables)... extensive checking (input check for duplicate entries, solution processing check to test for need of early inversion and automatic solution check).

USE - LPS/360 is governed by procedure control cards which specify the solution sequence. Input data may originate on cards and be stored on disk for subsequent processing. Several problems may be stored on the disk and updated, rerun, or combined. For example, a corporate model can be formed from divisional models; or a total production plan, from the plans for individual products.

Reports may be on cards or printer. Output cptions include a full solution report, comprehensive solution analysis and parametric analysis reports.

PROGRAMMING SYSTEMS -- LPS/360 operates under control of System/360 Disk Operating System (DOS). The source language is primarily FORTRAN IV (level E) with some Assembler (level F) routines.

MINIMUM SYSTEM REQUIREMENTS - A minimum configuration for LPS/360 includes a System/360 Model 25E (32K) with Floating Point feature (#4427), a 1052 Printer-Keyboard console, a card reader (1442, 2501,2520, or 2540), a card punch (1442, 2520, 2540), a printer (1403 or 1443), and a 2311 Disk Storage Drive. A 2400 Series Tape Unit and/or an additional 2311 is required for installing and maintaining LPS/360, but not for actual program operation. Also, a 2400 Series Tape Drive is required for compiling and assembling the distributed source code.

The System/360 recommended for best performance and simplest operation includes a System/360 Model 30F (64K) with Floating Point feature (#4427), a 1052 Printer-Keyboard console, a 2540 Card Read Punch, a 1403 Printer, two 2311 Disk Storage Drives for one 2314 Direct Access Stcrage Facility), and a 2400 Series Tape Unit.

Users of the 64K version of LPS must have 50K bytes of core available for program and data area; for the 32K version of LPS, users must have 26K bytes cf core available (K=1024).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description Manual (H20-0607)...Operations Manual (H20-0611).
MACHINE READABLE - Appropriate material delivered. 2311 users must specify Program Number Extension "2311". 2314 users must specify Program Number Extension "2314".

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360ACO18X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	2311	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01
		1316	52	01
	2314	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CO-20X
MATHEMATICAL PROGRAMMING SYSTEM/360 REPORT GENERATOR

DESCRIPTION - The MPS/360 Report Generator provides the fast, easy-to-use, report writing capability. The MPS/360 Report Generator (MPSRG) contains a control card type report language and a set of three procedures operating under the control of MPS/360, which compile and execute the report statements.

MPSRG is a language processor which facilitates output analysis functions and report writing associated with the Mathematical Programming System/360 (360A-CO-14X). The user may write an MPSRG program to analyze an MPS/360 solution and produce data on an external file pertaining to this solution, or generate a management report from an MPS/360 solution.

FEATURES - Solution values and problem data referenced by name... macro definitions which reduce the number of statements needed to describe a report... generation of external files which may be used for further processing... transfer of control based upon intermediate ccmputations...

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easy to learn... non-programmers can use.

USE - The report is described by a report language program. This program is then processed by the MPSRG procedures: ANALYZE which checks for syntactical accuracy and produces an internal form of the program, SETREP which resolves symbolic references to original problem data, and REPORT which produces the report. All procedures are called by the MPS/360 procedure call statement.

PROGRAMMING SYSTEMS - The program is written in the OS/360 Assembler Language. It operates under the control of MPS/360, which operates under OS/360 PCP, MFT, or MVT operations, and uses the BSAM and EXCP data access methods.

MINIMUM SYSTEM REQUIREMENTS - MPSRG requires a System/360 with at least 65,536 bytes and the Universal Instruction Set. If the system output is a printer, it must have 132 print positions. A minimum of 44K bytes must be available for MPSRG. MPSRG supports the 2400 series Magnetic Tape Units (0 track only) and the 2311, 2314, 2301, 2302, and 2303 Direct Access Storage Devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory, Operations Manual (H20-0561), Program Description Manual (H20-0560).
MACHINE READABLE - Relocatable load modules and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Symbolic code.

ORDERING INFORMATION: PROGRAM NUMBER 360ACO20X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
Optional	none	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01

360A-CP-04X *M
PROJECT MANAGEMENT SYSTEM

DESCRIPTION - PMS/360 is a battery of computer program modules that can be combined to form the data processing elements of various management systems applications for cost and schedule planning and control. These modules support critical path analysis, project cost and progress control, and flexible report preparation. Brief descriptions of these application techniques and their salient features are described below.

PMS/360 - Network Processor - This processor is the key program module for executing the Program Evaluation and Review Technique (PERT), and other critical path analyses. PERT has evolved into a versatile management system. Its recommended implementation includes a work-sequencing operation that treats a project as a series of interrelated activities, some can be done in parallel, others must be done serially. A project's work when displayed in this fashion forms a network. The longest time path through this network determines the time required to complete the project. This path is called the critical path. All other paths through the network have some slack with respect to this critical path. The job of project management then becomes one of so scheduling both critical and non-critical work that it takes best advantage of available resources while making the critical path as short as feasible. PMS/360 is an extremely versatile computer program for implementing PERT-type technique. Its features include variable size data fields... variable ordering of input elements on data cards... flexible calendar capable of specifying holidays and vacation periods... activites can be tagged for work on holidays... optional use of master files... networks may contain up to 254 subnet size ranges from 2,000 to 32,000 activities, depending on core memory, disk memory, the size of other data elements, operating systems, etc.... ability to process either the network or the subnet approach to PERT... ability to accept activity time durations in hours, days, weeks, or months... nine levels of milestone summarization... two methods of milestone summarization... one level of activity summarization that allows the summary activities to be specified explicitly... a description of up to 99 characters for activities and milestone events that may be subdivided and operated upon in the PMS/360 - Report Processor... output through the PMS/360 Report Processor can be formatted and tailored to individual needs... user control of program logic through modular design... programmed for easy modification.

PMS/360 - Cost Processor - This program module is a collection of project-oriented manpower, material and cost planning and control subroutines. It can be used in

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conjunction with PERT, or in a completely separate "companion" application. When used with the other major modules of PMS/360 to implement the DOD/NASA PERT COST technique, it can produce the reports required for internal control and the total management cycle. Its features include an accounting calendar for variable cost period reporting... rate tables for budgets, actuals, estimates, commitments and obligations... Charge Number rate tables for application of factors such as general and administrative expenses and special fees... Nine-level Work Breakdown Structure for product-oriented cost reporting... Nine-level Organization Breakdown Structure for function-oriented cost reporting... optional use of master file... approximately 32,000 charge numbers and organization codes permitted at each level of both the Work Breakdown Structure and the Organization Breakdown Structure... grouping factors for summary resource reporting... variable card format... variable field size for many data elements... description field for use as a user option... user control of program logic through the modular design... programmed for easy modification... additional "customized" reports possible through the PMS/360 Report Processor.

PMS/360 - Report Processor - The Report Processor is designed for use in output report preparation for the other PMS/360 modules, or as an independent module within the framework of PMS. Its features include a set of PERT reports (similar to those produced by IBM PERT COST II, 7090-CP-02X)... DOD/NASA PERT Cost reports... procedures that allow a user to define his own reports without the aid of a programmer... ability to read a wide range of input tapes other than those prepared by other PMS/360 modules... programmed for easy modification... arithmetic and logical procedures permit analysis of data to be reported... selectivity of data for processing.

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language. It operates under the control of OS/360 and uses the QSAM Data Access Method.

MINIMUM SYSTEM REQUIREMENTS - PMS/360 will require a minimum of 44K data bytes of core storage over and above the requirements of OS/360. If large core size is available, increased data capacity (network sizes, etc.) can be handled. The Standard Instruction set and the Decimal Feature Instruction Set are used. If the systems output device is a printer it must have 132 print positions. Peripheral devices supported by PMS/360 include all devices supported by OS/360 where QSAM is an accepted method.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Users manual, H20-0344.
MACHINE READABLE - Load modules, sample problem, Report PROCESSOR MACRO.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - SOURCE CODE.

ORDERING INFORMATION: PROGRAM NUMBER 360ACP04X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01

360A-CP-06X *M
PROJECT CONTROL SYSTEM

DESCRIPTION - This program has the same features as the 1130 Project Control System. However, the IBM Project Control System/360 can process networks more than twice as large as those processed by the 1130/PCS. Project Control System/360 provides the advanced tools needed by management to fulfill its responsibilities in the planning, supervising and controlling of project-oriented work by providing extensive capability in the following operations or techniques: Planning... Scheduling... Report Preparation. While it provides some capability for resource allocation and cost estimating, PCS/360 does not directly cover these techniques. For critical path networks, PCS/360 will process 5,000 activities either in the form of precedence lists or in PERT/CPM notation. Its design permits a very simple approach to networking, but also offers many of the sophisticated features normally found only in programs designed for larger configurations.

USE - The use of PCS/360 is in the areas of government and industry concerned with construction or maintenance. The needs in these areas determine the title and format of the field report and the format of the various input cards. However, intensive investigation has revealed that there are no essential differences among the needs of all

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critical path users. For this reason, PCS/360 can provide critical path capability for a broad range of DOS/360 users, regardless of industry.

SAMPLE APPLICATIONS are -
- Manufacturing and Distribution Industries -- to schedule construction operations, aerospace research/development projects, the use of mining equipment, crude petroleum manufacturing, natural gas operations, construction, repair and maintenance, pulp mill operations, paper and paperboard manufacturing, book preparation and printing and blast furnace maintenance.
- Science Industries -- schedule applied research projects and computer program development.
- Service Industries -- to schedule power plant operations, bank clearing-house operations, dividend check distribution and insurance report preparation.
- GEM Accounts -- for internal management control as well as for contractor control, text production of biological products, experimentation with drugs, and university and college curricula and facilities usage.
- Transportation Industry -- to schedule freight forwarding operations, terminal and service facilities, and the repair and maintenance of equipment.

In addition, these project control techniques are extensively used for controlling the design and implementation of data processing systems in virtually all industries.

FEATURES - Ability to store and retrieve up to 52 networks on disk...a significant throughput improvement in network generation, milestone processing, updating and report printing...hours per work day specified by the user...less disk space required for processing...milestones can be tied to both the start and finish of a work item...automatic updating of current duration for in-progress work items when no progress is reported in current run...suppression of printing of zero duration work items on selected reports...option to remove actual data from files...addition of Type IV and V schedule dates to permit more extensive float analysis...5,000 work items (or PERT/CPM activities)...12,500 precedence relationships...each precedence relationship can be lagged...the number of days in the work week can be specified for each item...for in-progress work items, progress can be reported as a percent completion, or as a number of work days remaining...scheduled and actual dates can be assigned to both the beginning and end of each work item...arbitrary non-work days can be incorporated into the calendar...basic resource scheduling and cost summarization capability is provided...tabular and graphic reports are available.

PROGRAMMING SYSTEMS - The program is written in a combination of FORTRAN and Assembler Language to operate under the DisK Operating System. While the program is designed to meet the needs of most users without modification, it is recognized that special individual requirements do arise. Therefore, the elements of the program written in FORTRAN are those that the user is most likely to modify to suit his application.

MINIMUM SYSTEM REQUIREMENTS - A 32K 2030 Processing Unit (Model E) with Floating Point (No. 4427), a 1052 Console, a card read/punch, a printer, and two 2311 Disk Storage Drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description and Operations Manual, H20-0376.
MACHINE READABLE - Relocatable object program modules and sample problem including sample job control statements.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Program Material List.
MACHINE READABLE - Source statements.

ORDERING INFORMATION: PROGRAM NUMBER 360ACP06X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CS-17X *M
GENERAL PURPOSE SIMULATION SYSTEM FOR OPERATION UNDER OS/360

DESCRIPTION - GPSS/360 is a broad range general purpose tool for modeling and examining the behavior of systems in the engineering and management science areas. Many applications of a complex logical and procedure oriented nature which ordinarily defy mathematical description can be easily described and studied using GPSS. Varying environments may be simply introduced to enable the user

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to explore alternatives, and identify capacity limitations. Both environment and activities may have random variations. Proposed changes to existing policies, methods, and operations can be subjected to critical performance criteria and evaluted. The user may also investigate and judge the value of new proposals without costly capital investments and without disturbing existing operations.

The application areas in which GPSS type simulations have been profitable are many and varied -- information system design, communication traffic flow and capacity studies, quality control procedure specification, advanced management planning, analysis of consumer behavior, inventory system design, job shop processing, studies of equipment availability, performance and reliability, transportation loading and scheduling, computer configuration evaluation, capital investment and risk studies, analysis of alternative military strategies, analysis of plans for corporate growth and merger, among others.

FEATURES - GPSS/360 provides the user with all of the capabilities of 7040/7044 and 7090/7094 GPSS III. Some of the features which give the program new and extended capabilities and versatility are GPSS/360 output editor which provides a means of editing and specifying the content, format and titles of simulation output... graphical (printer-plotted) output of Standard Numerical Attributes, provided for all atributes except Functions, Variables and Matrix Savevalues; output may be printed in bar-chart or continuous form... full-and half-word Savevalues which are available and may be specified in a matrix format... a new entity, GROUP, provided as a means of communicating with and referencing transactions or other entities which have common characteristics; this feature greatly enhances the set manipulating ability of GPSS... Boolean statements... eight independent Random Number Generators so that exact repetition of particular sequences are possible from run to run... The GPSS/360 Assembly Program which provides symbolic addressing of entities; a cross reference dictionary lists the blocks in which these symbols are referenced; a macro facility is also available... an update feature which permits maintenance and modification of symbolic models on disk or tape, thereby making unnecessary the maintenance of large card decks... User Chain statistics listing the maximum number of transactions to appear on the User Chain, average number of transactions to appear on the Chain, total number of transactions which were placed on the User Chain and the average time a transaction was on the User Chain... additional statistical Standard Numerical Attributes (SNA's), available to the user... transactions which are allowed to Preempt Facilities based on the priority of the transaction, and the Preempted transaction which is available for processing... the number and type of parameters associated with a transaction which are dynamically variable; parameters may be signed; parameters may be specified with a maximum magnitude of plus minus 2 to the thirty first -1. Programming experience is generally unnecessary for users of GPSS/360. The user need only know the rules by which system models are constructed. The logical structure and statistical parameters of the system are first modeled in terms of a GPSS/360 block diagram. Information from each block of the diagram is keypunched into cards, control cards are added, and the input is then loaded for assembly and execution. No operator intervention is required; error messages are printed automatically as required. The operating system used provides GPSS/360 with input-output services.

PROGRAMMING SYSTEMS - GPSS/360 is written in Assembler Language and operates under the control of Operating System/360.

MINIMUM SYSTEM REQUIEMENTS - A 2030 Model F with Universal Instruction Set; 1442, 2501, 2520 or 2540 Card Reader Punch; 1403, 1404, 1443 or 1445 Printer; and two 2311 Disk Storage Drives. Additional core storage will permit the construction of larger, more complex models.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Introductory Users Manual, H20-0304... Users Manual, H20-0326... Operators Manual, H20-0311.
MACHINE READABLE - Object decks and sample problem deck.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Material list.
MACHINE READABLE - Listings and source codes and is specified by using Program Number Extension LIST. Flowcharts and is specified by using Program Number Extension FLOW.

ORDERING INFORMATION: PROGRAM NUMBER 360ACS17X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	LIST	MT 9/800	28	01

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	DTR	9/1600	29	none
FLOW	DTR	9/800	28	none
	DTR	9/1600	29	none

360A-CS-19X *M

GENERAL PURPOSE SIMULATION SYSTEM FOR OPERATION UNDER DOS/360

DESCRIPTION - GPSS/360 is a broad range general purpose tool for modeling and examining the behavior of systems in the engineering and management science areas. Many applications of a complex logical and procedure oriented nature which ordinarily defy mathematical description can be easily described and studied using GPSS. Varying environments may be simply introduced to enable the user to explore alternative, and identify capacity limitations. Both environment and activities may have random variations. Proposed changes to existing policies, methods, and operations can be subjected to critical performance criteria and evaluated. The user may also investigate and judge the value of new proposals without costly capital investments and without disturbing existing operations.

The application areas in which GPSS type simulations have been profitable are many and varied -- information system design, communication traffic flow and capacity studies, quality control procedure specification, advanced management planning, analysis of consumer behavior, inventory system design, job shop processing, studies of equipment availability, performance and reliability, transportation loading and scheduling, computer configuration evaluation, capital investment and risk studies, analysis of alternative military strategies, analysis of plans for corporate growth and merger, among others.

FEATURES - GPSS/360 provides the user with all of the capabilities of 7040/7044 and 7090/7094 GPSS III. Some of the features which give the program new and extended capabilities and versatility are GPSS/360 output editor which provides a means of editing and specifying the content, format and titles of simulation output... graphical (printer-plotted) output of system numerical attributes, provided for all attributes except Functions, Variables and Matrix Savevalues; output may be printed in bar-chart or continuous form... full- and half-word Savevalues which are available and may be specified in a matrix format... a new entity, GROUP, provided as a means of communicating with and referencing transactions or other entities which have common characteristics; this feature greatly enhances the set manipulating ability of GPSS... Boolean statements... eight independent Random Number Generators so that exact repetition of particular sequences are possible from run to run... the GPSS/360 Assembly Program which provides symbolic addressing of entities; a cross reference dictionary lists the blocks in which these symbols are referenced; a macro facility is also available... an update feature which permits maintenance and modification of symbolic models on disk or tape, thereby making unnecessary the maintenance of large card decks... User Chain statistics listing the maximum number of transactions to appear on the User Chain, average number of transactions to appear on the User Chain, total number of transactions which were placed on the User Chain and the average time a transaction was on the User Chain... additional statistical System Numerical Attributes (SNA's), available to the user... transactions which are allowed to Preempt Facilities based on the priority of the transaction, and the Preempted transaction which is available for processing... the number and type of parameters associated with a transaction which are dynamically variable; parameters may be signed; parameters may be specified with a maximum magnitude of plus minus 2 to the thirty first -1. Programming experience is generally unnecessary for users of GPSS/360. The user need only know the rules by which system models are constructed. The logical structure and statistical parameters of the system are first modeled in terms of a GPSS/360 block diagram. Information from each block of the diagram is keypunched into cards, control cards are added, and the input is then loaded for assembly and execution. No operator intervention is required; error messages are printed automatically as required. The operating system used provides GPSS/360 with input/output services.

PROGRAMMING SYSTEMS - GPSS/360 is written in Assembler Language and operates under the control of the Disk Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Model F with Universal Instruction Set; 1442, 2501, 2520 or 2540 Card Reader Punch; 1403, 1404, 1443 or 1445 Printer; and either two 2311 Disk Storage Drives or one 2311 and four 2400 Series Magnetic Tape Units. Additional core storage will permit the construction of larger, more complex models.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Introductory Users Manual, H20-0304... Users Manual, H20-0326... Operators Manual, H20-0327.
MACHINE READABLE - Object decks and sample problem deck.

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OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Material list.
MACHINE READABLE - Listings and source decks, and is specified by using Program Number Extension LIST. Flowcharts, and is specified by using Program Number Extension FLOW.

ORDERING INFORMATION: PROGRAM NUMBER 360ACS19X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	LIST	MT 9/800	28	01
		DTR 9/1600	29	none
	FLOW	DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CX-12X *M

DOCUMENT PROCESSING SYSTEM

DESCRIPTION - The Document Processing System provides for the creation of document files by storing, in machine-readable form, either full text, abstracts, or keywords. The program generates a series of interrelated files which furnish direct access to each textword or keyword and the The program generates a series of interrelated files which furnish direct access to each textword or keyword and the documents which contain them. A dictionary file provides control over the words available for searching. Contextual relationship is preserved by storing in the master file every word (in coded form) in the sequence in which it occurred in the input. This capability ensures high precision in answering queries. To assure a high level of retrieval of relevant documents, the Document Processing System optionally provides for the maintenance of a Synonym/Equivalents file which is designed to expand terms used by the search. Where full text of a document or at least an abstract is available in machine-readable form, it may optionally be stored in a file and presented in answer to a query. Converts input source records into three searchable files. The input record format must contain a unique and ever-increasing identification number (assigned by the user) and at least one alphameric text word. Optional fixed or variable length bibliographic (formatted) fields may be included in the input source record. The system compares, on a word basis, the contents of the narrative portion of the input record against a dictionary file containing acceptable terms obtained from previous processing. If the word already exists in this file, the unique identification number of the input record containing this alphameric word is placed in a Vocabulary File, as well as all successive input record numbers containing this specific word. Hence, if a given word occurred ten times in document No. 123 and 100 times in document No. 456, the Dictionary File would contain a single entry (for the given word) and an associated record in the Vocabulary file with document numbers 123 and 456. A third, or Master, file contains for each input record the contents of the bibliographic (formatted) fields as well as a coded representation of the narrative data so as to indicate to the program the relative location of each word within the narrative portion of the input record.

Two optional files can also be created - (1) an Auxiliary Text file, which stores, verbatim, the narrative, and (2) a Synonym/Equivalent file, which the user creates from the words or terms he frequently associates with those in the dictionary. With this facility, for example, a multi-language data base might be searched from an inquiry containing words from only one language.

FEATURES - Data base creation using either full text, abstracts or index terms... Word and document frequency counts to improve search word effectiveness... Words occurring in the input can be eliminated from further processing by a variety of system options... Search expansion employing terms selected by user... Search precision by preserving context... Specialized search operators against bibliographic (formatted) fields- such as between, mask, scan, and numeric operators... Search language easily learned... Printed index--search word and document frequencies, document cross references, and reference field and text listing by selected keyword... Search and output language allowing keyword (dictionary) parameters; sentence, paragraph, or positional separation restrictors; synonym, equivalents, or truncation expanders; reference field parameters; or logical combinations of parameters.

USE - As input, the program accepts user-defined documents composed of a sequential document number, bibliographic data, and narrative data. The program converts narrative data from all documents into alphamerically ordered search terms, creates a file accessing dictionary composed of the unique words of the set of documents, and stores a

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searchable representation of each documents original terminology and context. Moreover, the program stores reference data (bibliography and control number) as formatted fields within pertinent records containing document text representation. If full-text retrieval is elected as an installation option, the program alsc stores a verbatim copy of input documents. A user-generated exclusion table causes the system to purge common words; a user word edit further limits dictionary size and contents. A users search request accesses the dictionary with a Boolean combination of search terms possible constrained by relative position indicators- word distance, sentence, paragraph. The request may also cite reference data as search criteria. The program then amasses and merges strings of document control numbers, reduces the candidate documents through a check of formatted reference fields, satisfies search-term-position criteria, and prints a bibliography of qualifying documents. A full-text printout is an installation option. A search procedure can also employ synonymous/equivalent terms from two user-generated search-word-substitution lists. A special kind of search procedure-index list-produces various forms of topical listings based on the words contained in the dictionary. A system user must convert his document source data into machine readable records acceptable by the document processing system, for an I/O device supported by OS/360.

PROGRAMMING SYSTEMS - The application program is written in the OS/360 Assembler Ianguage. Operation of the Document Processing System hinges on the following OS/360 options and components -

Primary Control Program - 360S-CI-505
Input/Output Support for BDAM - 360S-DM-509
Utilities - 360S-UT-506
Sort/Merge - 360S-SM-223
Linkage Editor E - 360S-ED-510

MINIMUM SYSTEM REQUIREMENTS - Requires OS/360 facilities for planned configurations. As a guideline - S/360 Model 2040 G. Dynamic main storage - 44K bytes. Addition to OS/360 secondary storage requirements, a minimum of 3 IBM 2311 Disk Drives, card reader, tape station or printer (for output), provision to sort user data sets.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description and Operations Manual, H20-0477.
MACHINE READABLE - Object programs and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Application Directory.
MACHINE READABLE - Card-image source, Flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX12X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/800	28	none
		MT 9/1600	29	01
		MT 7DC/800	26	01

360A-CX-15X *N
ATTACHED SUPPORT PROCESSOR

DESCRIPTION - Attached Support Processor (ASP) provides a multiprocessor operating system as an extension of S/360 Operating System (OS/360). ASP supports Dual Main Processors and local mode execution on one processor. Improvements have also been added to enhance system operation and to facilitate implementation of local modifications and extensions. Through a reduction in required operator intervention, ASP provides an improved operational environment, enhancing system workload capacity and reducing turnaround time.

The configuration consists of one, two, or three System/360 computers connected via the channel-to-channel adapter. The Support Processor(Model 40 or larger) provides the support functions (including card reading, punching and printing) under computer control, while one or two high-speed Main Processors (usually Model 50, 65 or 75) perform the actual workload. ASP also permits intermixing of OS/360 and 709X Emulator (360C-EU-729) jobs in the input stream, supports Remote Job Processing from STR or BSC terminals, and permits other background functions to share Support Processor CPU time with the primary support functions.

The ASP Supervisor operates as a single-step job in the Support Processor under control of OS/360. The OS/360 PCP, MFT or MVT Control Programs may be used on the Support Processor. The ASP Supervisor schedules and initiates the various support and background functions. It is multiprogrammed within itself to minimize the overhead associated with the sharing of CPU and channel time. Excess CPU

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capacity may be absorbed by other OS/360 tasks if MVT or MFT is utilized on the Support Processor.

The system I/O devices for the Main Processor are replaced by the channel-to-channel connection with the Support Processor. DASDs for systems residence and program library are attached to the Main Processor, as are any I/O devices accessed during execution by the problem programs. The operating system in the Main Processor provides an environment for the problem program identical to a stand-alone system. The performance of the system is directly related to the throughput capability of OS/360 on the Main Processor

Modifications incorporated into OS/360 permit 709X Emulator and OS/360 jobs to be intermixed in the input stream if the 709X Emulator feature is installed on a Model 65 Main Processor. The system input/output streams for Emulator jobs are handled by the Support Processor in the same manner as are those for OS/360 jobs.

The ASP system accepts job streams from remote terminals over STR or BSC transmission lines. The STR package supports three I/O data formats for Remote Job Processing. One is compatible with the IBM 1974 or IBM 1978 terminals (RPQ devices). The second is oriented toward S/360 Model 20s; and the third is designed for other S/360 processors equipped with proper STR features on a 2701 Data Adapter Unit, and the 1130 system. The data format is suitable for any computer which has an 8-bit byte data format and which can accept STR transmission. The BSC package supports three data formats for Remote Job Processing. One is compatible with the 2780 Data Transmission Terminal, and the other two are full and patrial pressed formats that are designed for the S/360 and 1130 computer terminals. Note that the ASP system does NOT include the computer programming necessary in the remote terminals.

If the workload capacity at an installation exceeds one Main Processor, the ASP Support Processor can be expanded to support an additional Main Processor, balancing the total installation workload between the two.

FEATURES - Increased workload capacity... reduction of turnaround time... improved operating efficiency... intermixed OS/360 and 709X Emulator jobs in the input stream (for a Model 65 Main Processor with the 709X Emulator feature)... and workload balancing between multiple System/360 processors.

These features are made possible by:

- Computer-controlled execution of support functions in multiprogrammed mode on a lower cost Support Processor or in a partition/region of OS/360 MFT/MVT which permits:
 a. Priority job scheduling.
 b. Automatic processing of system I/O data sets.
 c. Automatic switching between OS/360 and 709X Emulator jobs.
 d. Concurrent processing of peripheral and other user programs, such as: Card-to-tape... tape-to-tape... tape-to-printer... tape-to-card... card-to-printer... card-to-card... 7090/94 Direct Couple Operating System (DUCS) Tape Format Deblocking... remote terminal transmission... remote terminal reception... user-written background programs... tape labeling... tape dumping.
- Reduction of resource interference on Main Processor in terms of:
 a. Core storage. Core buffering of Main Processor input and output data sets in the Support Processor.
 b. CPU time. Multiplexer channel interference and interrupt service for peripheral input/output devices eliminated in Main Processor.
 c. Data channels. Selector channel data flow time for system input and output on Main Processor reduced.
 d. Input/output devices. Algorithm provided for efficient management of direct access storage devices for system input and output data sets.
- Pre-execution setup of removable input/output devices on Main Processor.
- Support of multiple operator consoles for diversification of system operation.
- Concurrent I/O background processing on Support Processor during emulation on Main Processor.
- Selective job scheduling for Main Processors and Support Processor devices.
- Remote job processing from STR and BSC terminals.

USE - Operational control of the ASP system is exercised by the operator from the console typewriter or an alternate operator console on the Support Processor. A command language is provided to start ASP, to delete and restart jobs, to initiate background processing, to change priority of jobs, and to determine the backlog of jobs in the queue.

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PROGRAMMING SYSTEMS - The ASP system programs are written in OS/360 Macro Assembler Language to provide additional functions, known as Dynamic Support Programs (DSPs), can be incorporated into the Support Processor by the customer at his installation. These programs must also be written in OS/360 Macro Assembler Language. The minimum OS/360 control program that will execute ASP includes PCP, a linkage editor and the OS/360 utility programs. The OS/360 Macro Assembler program (F-level) must be available if program modifications are anticipated.

ASP users must order these programming systems separately: OS/360, the 709X Emulator program (360-EU-729), if used, and the Synchronous Transmit-Receive Access Method for OS/360 (360A-SE-33X), if STR terminals are to be used.

MINIMUM SYSTEM REQUIREMENTS - The configuration requirements for the Main Processor are identical with those of a stand-alone processor operating under OS/360, except that the channel-to-channel adapter replaces the normal system input and output devices. If the 709X Emulator is to be used, the Main Processor must have at least one 2311 Disk Storage Drive for OS/360 and 709X Emulator checkpoints. The modifications to the OS/360 Control Program nucleus that are required for operations as an ASP Main Processor increase the nucleus by approximately 3000 bytes. If the 709X Emulator is used, approximately 2000 more bytes must also be added to the nucleus.

SUPPORT PROCESSOR WITH OS/360 PRIMARY CONTROL PROGRAM: The minimum Support Processor for executing under the Primary Control Program is a 40G with two selector channels (one dedicated to the channel-to-channel adapter), one 1052 Printer-Keyboard,Model 7 (Console Typewriter), one 2540 Card Read/Punch, one 1403 Printer Model 2 or N1, and three 2311 Disk Storage Drives. This configuration permits queuing of up to 30 jobs. (A job is considered equal to a combined input and output stream of 5000 100-byte records.) System capability can be expanded by attaching additional units of the following: 1403 Printers, Model 2 or N1... 2540 Card Read/Punches... 2311 Disk Storage Drives... 2401 Magnetic Tape Drives (at least one 9-track or 7-track tape unit with Data Conversion feature is recommended for system maintenance). ASP supports 2401 Magnetic Tape Units for use by background programs.

In addition, a 2701 Data Adapter Unit with Synchronous Data Adapter Type I feature and the 2701 with the Synchronous Data Adapter Type II feature may be attached for Remote Job Processing. When Remote Job Processing is used, at least a Model 40H is required. A 2314 may be substituted for 2311 Disk Storage Drives as the ASP work queue device.

The following devices are supported as auxiliary operator consoles in the ASP system: IBM 2740 Communications Terminal attached on a dedicated line through an IBM 2701 Data Adapter Unit... IBM 2260 Model 1 Display Station attached through a directly attached 2848 Display Control Model 3 (with the Line Addressing feature)... IBM 1443 Model N1 Printer (output only)... IBM 1053 Model 4 Printer attached through an IBM 2848 Display Control (output only)... IBM 1403 Model 2 or N1 Printer (output only).

SUPPORT PROCESSOR WITH OS/360 MFT OR MVT CONTROL PROGRAM: The minimum support processor for use of OS/360 MFT in the Support Processor is the same as for the PCP except that the minimum processor for MFT is a Model 40H. For MFT operation the minimum partition size for ASP is 150,000 bytes. This system permits independent scheduling of other partitions by OS/360.

If MVT is to be used in local mode, the minimum processor is a Model 50I. In this mode of operation, the region size for ASP should by approximately 150,000 bytes. Consideration should be given to larger region sizes, commensurate with planned system facilities, such as additional Main Processor or Remote Job Processing.

At least one IBM 2401 Magnetic Tape Unit should be available for system maintenance.

SUPPORT PROCESSOR -- DUAL MAIN PROCESSORS: The minimum Support Processor in a Dual Main Processor configuration is the same as the system that supports the PCP with the following exceptions:

- The minimum Support Processor is a Model 50H. For reasons of system performance, the Model 40 is recommended except under controlled conditions. For Dual Main Processor support, the minimum partition size is 200,000 bytes.
- A minimum of four operator terminals, at least one of which must be an input Terminal, must be available to ASP (for example, a 1052 and three 2740s attached through a 2701).
- A 2314 Direct Access Storage facility for Support Processor work queue or the equivialent 2311 Disk Storage Drive capacity.
- At least one IBM 2401 Magnetic Tape Drive should be available for system maintenance.

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NOTE: These are complex configurations and must be system assured.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Programmers Manual, H20-0322...Console Operators Manual, H20-0321.. System Programmers Manual, H20-0323.
MACHINE READABLE - Object programs, source programs, OS/360 modifications, 709X Emulator modifications and Macro definitions.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Assembly listings.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX15X

	PROGRAM NUMBER EXTENSION		DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none		MT 9/800	28	01
			MT 9/1600	29	01
			MT 7DC/800	26	01
OPTIONAL	none		MT 9/800	28	02
		#	DTR 9/1600	29	none

The optional machine readable material consists of two DTR's.

360A-CX-16X
CONTINUOUS SYSTEM MODELING PROGRAM (CSMP)

DESCRIPTION - Simulation is a well established tool for investigating phenomena ranging from information flow in business organizations to the dynamic behavior of complex continuous system. For many problems, S/360 CSMP obviates the need to use an analog computer facility. It allows simulation problems to be prepared directly and simply from either a block diagram representation or a set of ordinary differential equations. It provides a basic set of functional blocks with which the components of a continuous system may be represented and accepts application-oriented statements for defining the connections between these functional blocks. This block modeling technique is common to engineering and scientific practice. S/360 CSMP also accepts FORTRAN statements, thereby allowing the user to readily handle nonlinear and time-variant problems of considerable complexity. Included in the basic function set are conventional analog computer components (i.e., integrators and relays, plus many special purpose functions like delay time and limiter functions). This basic library is augmented by the FORTRAN library. In addition, special functions can be defined by the user, thereby allowing S/360 CSMP to take on the characteristics of a language oriented to any particular special purpose field in continucus system simulation. Input and output are facilitated by means of user-oriented control statements. A fixed format is provided for printing (tabular format), print-plotting (graphic format), and preparation of a data set at selected increments of the independent variable. Convenient means are available for terminating a simulation run with a sequence of computations and logical tests. These can be designed to test run responses and define run control conditions for accomplishing iterative simulations of the type required in parameter optimization studies. With few exceptions, parameter data, run control data, and connection statements can be prepared in any order for automatic sequencing by the program. Through these features, S/360 CSMP permits the user to concentrate upon the phenomenon being simulated rather than the mechanism for implementing the simulation.

FEATURES - A problem can be prepared directly from either a functional block diagram or a system of ordinary differential equations... The input language is application oriented and free form... The statements may be generally written in any order, and, by user option, may be sequenced by the program to establish the correct information flow... FORTRAN statements can be intermixed with the S/360 CSMP simulation statements... The method of integration can be chosen from several standard options provided in the program... Output is provided automatically in a fixed format for all output options... Thirty-four standard functional blocks are provided, and, in addition, the user can add his own functions to the library... Simulation runs are completely repeatable... Problem Decks may be conveniently stored for future reruns... The entire simulation may be controlled by a sequence of conventional FORTRAN statements. The user must represent the phenomenon to be simulated by either an Analog Block Diagram or a System of Ordinary Differential Equations. Then the input language statements must be prepared and punched on cards for input to the application program. Familiarity with basic FORTRAN is helpful, but not necessary. Special functions may be defined either through FORTRAN programming or simply through a MACRO capability which permits the combination of individual library functions into larger functional blocks. A customer-prepared plotting program can be used with the output data file to obtain graphic output on any particular plotting equipment.

PROGRAMMING SYSTEMS - FORTRAN IV (E) is used as the source language for approximately 95 per cent of the programs.

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Operations not readily performed in FORTRAN IV (E) are coded as subroutines in System/360 Assembler Language. All routines operate under OS/360.

MINIMUM SYSTEM REQUIREMENTS - The program will require a minimum of 102K bytes of storage (excluding that required by OS/360), the Standard Instruction Set, and the Floating-Point option. In addition to the I/O units needed by the Operating System/360 for FORTRAN IV compiling, the program will require three logical utility units, one of which must be a direct access storage device (DASD).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Users Manual, H20-0367... Operators Manual, H20-0368.
MACHINE READABLE - Object modules and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source Modules.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX16X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CX-17X *M
REMOTE ACCESS COMPUTING SYSTEM (RAX)

DESCRIPTION - RAX provides sustained access to a System/360 from remote locations to enable programmers, engineers, scientists, and other users to obtain fast turnaround and reduced problem-solution time for their computational problems. RAX is a time shared, remote computing system. Users of RAX can submit Basic FORTRAN IV and Basic Assembler Language jobs for compilation and time-sliced execution from local and remote terminals, simultaneously with similar operations from other on-line equipment at the computer site. Programmers can compile, modify, and execute programs from their terminals while non-computer oriented users can be conversationally interacting with programs previously stored in the RAX library. Terminal users of RAX can access up to 64 disk units to read or write permanent or temporary files. Multiple users are able to access these files simultaneously. The temporary files allow preparation of intermediate results storage for later recall in that program or subsequent programs. RAX user flexibility is provided by a modular and compatible design. Three System/360 Models (30, 40, and 50) and three memory sizes (64K, 128K, and 256K bytes) are supported. Four terminals (the IBM 1050 Data Communications Terminal, the IBM 2741 Communications Terminal, the Nos. 33 and 35, ASR and KSR Teletypewriters, and the IBM 2260 Display Station) can be used depending on system memory size. Two 2311 Disk Storage Drives are necessary.

FEATURES -

- Up to 63 terminals can be used with RAX, depending upon the amount of core memory available.
- Terminals may be 1050s, 2741s, or TTYs which provide keyboard input, typewriter output as well as 2260s, which provide keyboard input and CRT display of up to 12 lines of output. In addition, the 1050s provide card and paper tape input-output, and the TTYs provide paper tape input. All terminal device types may be combined on the same system provided that the configuration restrictions are observed. The 1050s, TTYs, and 2741s may be at a remote location from the computer. The 2260s must be local. The TTYs must be dial up.
- The terminal user may save source or object programs and data or program output in the RAX user library. Saved information may be shared with other terminal users. File security is provided by means of a lock code which prevents unauthorized deletion or modification of any file in the library.
- The terminal user may use permanent or temporary files for input or output. When using the File Input-Output capability of RAX the user is able to specify the file characteristics (logical record size, file name, volume name, disposition, etc.) from the terminal. Multiple users are able to access the permanent files simultaneously. File Input-Output requires a minimum of 128K bytes and one 2311 in addition to system residence and user library units.
- A restart capability is provided for resumption of jobs after recovery from system's error. Upon recovery, RAX will indicate to each user the last line of input accepted or repeat the last few lines of output.
- The 2260 Display Stations allow entry of up to twelve lines of input at a time. The Non-Destructive Cursor feature is used to provide for single character modification within a line when updating program or

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data files.
- Object program execution storage of 32K bytes is provided on the minimum memory configuration. 64K bytes are available on the 128K and 256K byte configurations.
- Users of RAX may enter programs and data one line at a time from their terminals or use a single terminal command to insert a previously stored data or program module into their job stream at compile time.
- The user may enter either USASI Basic FORTRAN IV or Basic Assembler jobs from his terminals. All input-output must be programmed in FORTRAN and the execution of privileged instructions in a user program is not allowed.
- A DISPLAY command is available for total or selective listing of a user's input or library files.
- RAX provides for the running of background batch processing through the 2540 Card Read Punch. The background batch jobs utilize the machine when it is not serving the terminals. Virtually any job prepared for terminal processing will run in batch mode. In addition, the batch can address file input-output on magnetic tape. Batch mode makes possible lengthy computer runs where turnaround time is not of prime importance and can be used to enter large programs and data files into the library.

USE - Sustained access to a System/360 from remote locations enable engineers, scientists, and other users to realize fast turnaround and reduced problem solution time. FORTRAN programmers can compile, modify, and execute programs from remote terminals, while non-programmers may use programs previously stored in the RAX library. Familiarity with the RAX terminal command language and the operation of the terminal device enables the user to exploit the computational power of System/360 in a convenient manner.

RAX provides a facility for conversational interaction between a user and an executing program. This is accomplished by the use of input/output statements in a problem program which addresses the users terminal as an I/O device. Thus, programs can be written to take advantage of the "on-line" presence of the user by permitting him to selectively modify his input, observe intermediate results, and alter parameters or perhaps the execution sequence of the program based on his interpretation of these results.

PROGRAMMING SYSTEMS - RAX is written in BPS Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30F with one Selector Channel, Interval Timer, Storage Protection, Decimal Arithmetic, Floating Point Arithmetic features...1052 Printer-Keyboard Model 8 as a system console...2821 Control Unit Model 1...2540 Card Read Punch...1403 Printer Models 2, 3, 7 or N1...2841 Storage Control...two 2311 Disk Storage Drives; for attaching keyboard-typewriter terminals either a 2702 Transmission Control or a 2701 Data Adapter Unit. Up to ten keyboard-typewriter terminals may be attached to the minimum configuration. The 2260 Display Stations and terminal file capability are not supported on the 64K byte configuration. (For 2701 and 2702 features see Terminal Configuration Section.)

TERMINAL CONFIGURATION - The minimum IBM 1050 Data Communication Terminal consists of - one IBM 1051 Control Unit (Model 2) with the First Printer Attachment feature (No. 4408) and one IBM 1052 Printer-Keyboard (Model 2). The 1052 Printing Element used by RAX is Data 1 font (No. 9575 or 9576). The 1050 can utilize the 1054 Paper Tape Reader or 1056 Card Reader attached as reader No. 1 on the 1051. For use with the 1056 cards can be prepared on either the 26 or 29 Keypunch. The 1056 must have the Extended Character Read special feature.

IBM 1050 Data Communications Terminal: The IBM 1050 may be attached to the system through a 2701 or 2702. Specifications are: IBM 2701 Data Adapter Unit...Terminal Adapter Type 1 (#4645 or 4646)...Appropriate line adapters (up to 4). IBM 2702 Transmission Control...Terminal Control Type 1 (#4615)...Selective Speed feature (#9684)...Appropriate line adapters.

MAXIMUM SUPPORT CONFIGURATIONS - System/360 Model 50H (256K byte memory) with three Selector Channels, Interval Timer, Storage Protection, Decimal Arithmetic, Floating Point Arithmetic, 1052 Printer-Keyboard Model 7, 2540 Card Read Punch, 1403 Printer Models 2, 3, 7, or N1, up to sixty-four 2311 Disk Storage Drives, up to sixty-three keyboard-type-writer terminals (connected via communications equipment to 2701 and/or 2702 control units), one 2848 Display Control Model 3 with Non-Destructive Cursor feature and up to eight 2260 Display Stations with the Alphanumeric Keyboard feature(with maximum of sixty-three terminals in all, four 2400 tape drives with a maximum of 64 disk and tape drives).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description Manual, H20-0354...Operations Manual, H20-0355.

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MACHINE READABLE - Object program load modules and sample problems.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Option 1 - Source code which is specified by using program number extension OPT1. Option 2 - Assembly listings which are specified by using program number extension OPT2.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX17X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	OPT1	DTR 9/800	28	none
		MT 9/1600	29	01
		MT 7DC/800	26	01
	OPT2	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01

360A-CX-18X *M
ADMINISTRATIVE TERMINAL SYSTEM (UNDER) DOS/360

DESCRIPTION - ATS/360 under DOS is intended for System/360 Model 30, 40, and 50, and uses the Multiprogramming features of DOS/360. ATS/360 is a new dimension in text and data processing. ATS/360 is a user-oriented remote terminal system designed for large text and data files. The terminal user has complete control over the management and processing of his own information files. ATS/360 operates under DOS/360 which means the customer does not have to dedicate an entire system to ATS/360 operations.

ATS/360 is programmed to run in one partition under DOS/360 using the Multiprogramming Supervisor. Other programs may run concurrently with and independently of normal ATS/360 terminal operation, thereby extending the productivity of System/360 for users of ATS/360.

ATS/360 uses include source data recording, data modification and correction, data manipulation, retrieval of information from large disk and magnetic tape files; outputting of information on the same terminal or another terminal, magnetic tape, punched cards, and high speed upper and lower case printed output. Information may be entered and stored in either a free or fixed form. Stored information may be recalled for further processing.

FEATURES - Remote entry and processing of large text and data files... direct access by an alphameric name to large data banks by remote terminals.. ATS/360 activities are time shared with other data processing activities on the same computer... reduced cost of capturing information at its pcint of origination... ATS/360 information is processed in real-time... low entry and start-up cost... little skill and training needed to use the system... data correction, modification and rearrangement by backspacing and retyping during original entry; retyping beginning with a particular phrase; replacing a word or phrase; inserting, erasing, copying, or moving lines of information; gathering stored information in any sequence... storage and retrieval of data from disk files or magnetic tape... remote or centralized, upper case, or upper and lower case printed output, magnetic tape or punched card; output format controlled from the terminal at the time of output by--limiting free-form text line length, hyphenless justification of right-hand margin, intermix of free-form and fixed format informaticn, controlled vertical spacing, very flexible heading, footing, and page numbering capabilities, halting to allow insertion of information or changing of print elements, etc.

PROGRAMMING SYSTEMS - The ATS/360 program is written in DOS/360 Assembler Language and operates under control of DOS/360 with the Multiprogramming feature.

The DOS/360 version uses the Console Interrupt Key to call for the cessation of ATS/360 peripheral functions. Therefore, background programs that use this key for console operator initiated messages may not run while ATS/360 is running.

MINIMUM SYSTEM REQUIREMENTS - Model F Processing Unit (64K bytes), one selector channel, 2052 Printer-Keyboard with storage drives... one 2702 Transmission Control, 2741 Communication Terminals equipped with appropriate attachment... 2841 control unit, two 2311 disk with Standard Courier 72 Selectric (registered trade mark) Printing Element (part 1167043) with feature no. 9812, and with the appropriate line adapters. ATS/360 supports only the correspondence code 2741 Terminals without the Interrupt feature. These components are in addition to DOS/360 requirements of one 2311 Disk Storage Drive, one card

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reader, one card punch, and one printer. This minimum configuration could preclude some ATS/360 document transmission functions depending upon selection of I/O devices. One 2400 Magnetic Tape Drive is required for system generation.

In practice it is recommended that a user include sufficient components to obtain maximum benefits and performance from ATS/360. Additional components supported include up to eight 2311 Disk Storage Drives... one or more 2400 Magnetic Tape Drives with tape control units, card reader, card punch, and printer producing at least 132 character print lines.

ATS/360 does not in general require exclusive use of any particular channel. ATS/360 I/O devices are channel independent to the extent of physical attachment. Several 2311's, for example, may be assigned to separate control units on each of two selector channels if desired; furthermore, programs in other partitions may share channels with ATS/360 operations. However, if programs in other partitions require a selector channel, for best ATS/360 performance it is recommended that a second selector channel be added, one dedicated to ATS/360 functions, and the other to background programs. Further, it is recommended that burst mode devices not be attached to the multiplexer channel to avoid interference problems which might occur in some configurations.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Terminal Operator's Manual (H20-0511)... Program Description Manual (H20-0509).
MACHINE READABLE - ATS/360 macros for ATS assembly, and object code are provided.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source statements and flowchart print lines.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX18X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01

360A-CX-19X *M
ADMINISTRATIVE TERMINAL SYSTEM UNDER OS/360

DESCRIPTION - ATS/360 is a new dimension in data entry and text processing. ATS/360 is a user-oriented remote typewriter terminal system which operates in the multiprogrammed environment of either OS/360 MFT (Version 2) or MVT, typically in the high priority position/region. Multiprogramming means the customer does not need to dedicate an entire system to ATS/360 operations. Other programs may run concurrently with and independently of normal ATS/360 terminal operation, thereby extending the productivity of System/360 for user of ATS/360.

The three major applications of ATS/360 are:

Multiprogramming means the customer does not need to dedicate an entire system to ATS/360 operations. Other programs may run concurrently with and independently of normal ATS/360 terminal operation, thereby extending the productivity of System/360 for user of ATS/360.

The three major applications of ATS/360 are:

1. Data Entry — typically by placing typewriter terminals in the source department.
2. Text Processing — including Terminal input, Terminal editing, and Terminal or 1403 N1 Printer formatted output.
3. Foundation — for specialized typewriter terminal applications by the modification of ATS programs or the addition of new programs to ATS.

FEATURES - The features of ATS/360 are used in three basic areas: those which have general applications for all the uses of the system, those which are oriented to text and documentation processing, and those which are oriented to data entry:

General -
- Low entry and start up costs.
- In some applications the capture of text or data can take place as it is originated.

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- Is multiprogrammed, which allows for efficient use of the computer.
- Rapid direct access to stored documents.
- Input and corrections are easy and fast.
- Terminal language compatibility with Call/360 Datatext.
- Productive without customer program change or modification.
- Commands are short mnemonics, easy to learn and quick to use.

Text -
- Upper and lower case printing.
- Corrections do not require extensive retyping.
- Hyphenless justification of right margin.
- Free form input for "formatted" (narrative) text, fixed form for tabular material.
- Computer printing (1403 N1 with TN train) of upper and lower case, about 5,000 words per minute.
- Correction facilities include change/addition/deletion of a phrase or words; addition or deletion of paragraphs; rearrangements of sentences or paragraphs.
- Flexible headings, footings, and page numbering.
- Line width and page depth controlled by terminal operator.
- Vertical spacing commands for the later insertion of art work.
- Tabs used like regular typewriter.

Data Entry -
- Quickly changing data can be easily maintained.
- Automatic sequence numbering, including resetting the number at any point. Field duplication.
- Variable length record sizes up to 132 characters.
- Output as OS data set to disk or tape; OS writers used to write to punch or printer.
- Easy to use the terminal typewriter in the source department.
- Upper only or upper and lower case.

PROGRAMMING SYSTEMS - The ATS/360 program is written in OS/360 Assembler Language and operates under control of OS/360, either with MFT (Version 2) or MVT. ATS/360 writes its peripheral (card, printer) output on disk or tape as an OS data set. Input to ATS/360 can be an OS data set. A writer in another partition/region is required to perform the actual output to the peripheral device.

MINIMUM SYSTEM REQUIREMENTS: The basic machine components used for ATS/360 consists of a System/360 Processing Unit with at least 22,528 bytes of dynamic main storage (see note below), Multiplexer Channel, Selector Channel...1052 Printer-Keyboard for other system console device)...2841 Storage Control Unit...2311 Disk Storage Drives (2 minimum) or, 2314 Direct Access Storage Facility...2702 or 2703 Transmission Control...2741 Communication Terminal, with only Feature #9812, Courier 72 standard IBM SELECTRIC printing element (part 1167043), and an appropriate line adapter.

NOTE: In addition to the 22,528 bytes of dynamic main storage specified above, provision must be made for the OS/360 Queued Sequential Access Method (QSAM) routines. Additional dynamic main storage will be required to support additional terminals and devices and optional ATS functions. See the Application Description Manual for further information. The above configuration is in addition to OS/360 requirements. This configuration will preclude some ATS/360 document transmission capabilities depending on the selection of 1/0 devices and the availability of additional dynamic main storage. A typical ATS system supporting ten terminals and a peripheral printing capability will require 45,056 bytes of dynamic main storage in addition to that required by the QSAM routines. A typical 100 terminal system would require 115 - 140K bytes of dynamic main storage in addition to that required by the QSAM routines. In any case, a separate partition region is also required to write the print/punch data set on the printer and punch.

One 2400 Magnetic Tape Unit must be available for system generation and maintenance of ATS/360. One 2400 Magnetic Tape Unit is desirable for ATS/360 peripheral operations. It is also desirable that at least one 2741 Communication Terminal be located near the system console.

Optional Machine Units: Additional Processor Storage (see the Application Description Manual)...Additional Selector Channel(s)...Additional 2741 Communications Terminals (see the Application Description Manual)... 2311 Disk Storage Drives...2314 Direct Access Storage Facility (one or more)...2400 Magnetic Tape Units with Control Unit (one or more)...Card Read Punch Unit... Printer (producing at least 132 character print line).

If upper and lower case high-speed printing is desired, a 1403 Printer Model 2, 3, or N1 equipped with the universal character set feature and the TN printing arrangement may be used. It should be noted that the TN characters are appreciably thinner than the Courier characters used at the terminal. The print quality of the 1403 can be improved and made to approximate that of the 2741 by the use of the special "Courier" characters. The quality may be further improved by special "wide hammers" on the printer.

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Both the special slugs and the wide hammers are RPQ items. See the Application Description Manual for further information.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Terminal Operations Manual (H20-0589)...Operations Manual (H20-0590)...Program Description Manual (H20-0582).
MACHINE READABLE - Contains the material required to install ATS/360 plus two archive documents (terminal texts) which are necessary for terminal maintenance.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Print images of the ATS/360 flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX19X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL		MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CX-20X
DATA ACQUISITION MULTIPROGRAMMING SYSTEM

DESCRIPTION - DAMPS is an extension of the System/360 Model 44 Programming System, supporting two independent partitions. The foreground partition is particularly useful for online or real-time applications. In addition to standard System/360 Model 44 Programming System Facilities, the foreground partition supports the attachment of program tasks to the various levels of the Priority Interrupt Special Feature. Foreground program tasks can also be scheduled for execution during periods of low activity. A real-time interface is provided for connecting directly with online applications. The background partition supports a standard System/360 Model 44 Programming System job stream. The Storage Protection Special Feature is supported, but not required.

DAMPS supports two independent user partitions. Storage Protection Special Feature support is provided for the two user partitions and the partition containing the DAMPS supervisor.

The foreground partition operates in conjunction with the Priority Interrupt Special Feature and the IBM 1827 Data Control Unit or other online interface. The partition is designed to interface directly with online, scientific applications such as: Hybrid computing...data acquisition...instrument control...laboratory automation.

The foreground partition supports the assignment of program tasks to the various priority levels, to be scheduled as immediate response to external events. Foreground tasks may be dynamically scheduled for execution while there are no active priority interrupt levels. To sustain a higher throughput rate for real-time jobs, the foreground processing tasks can be multiprogrammed. The posture of the system, with respect to priority interrupts, can be altered with special subroutines provided. Foreground tasks use supervisor capabilities compatible with the System/360 Model 44 Programming System including FETCH and LOAD, while priority response routines are provided with special capabilities which support a broad range of processing at a priority level.

The background partition supports a standard System/360 Model 44 Programming System job steam. The background partition operates at a low priority, using only the processing time not required by the foreground application.

FEATURES - Special routines can be associated with an immediate response to an external event through the Priority Interrupt special feature...foreground processing can be easily scheduled during priority interrupt...foreground processing can be multiprogrammed...the user can easily adjust the programs used for responding to priority interrupts...the capabilities associated with the System/360 Model 44 Programming System are available to the user for preparation and the processing of real-time jobs...a special real-time channel scheduler is provided for channels dedicated to the processing of real-time data...IBM 1827 Data Control Unit and tape subroutines are provided for use with the real-time channel scheduler...the user, at his own discretion, can save and restore as little of the status of the computer at interrupt time as he deems necessary...all the dynamic overlay capability available in the Model 44 Programming System is available to the real-time job.

USE - The two partitions of DAMPS function independently. Each partition has its own Job Control Processor.

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Background jcb control statements are entered via the System/360 Model 44 Programming System standard system input device. Foreground job control statements are entered via the console typewriter. The foreground and background job control languages are compatible.

User written applicatcn programs, in either FORTRAN or Assembler Language, are prepared in the background partition under DAMPS. Both types of application programs can use all of the facilities of the System/360 Model 44 Programming System, while only foreground programs can use the real-time facilities. A foreground application program, after being placed in the phase library by the Linkage Editor, may be put into execution by the operator via the console typewriter. Additional phases of the foreground application may be fetched after execution has commenced using the standard System/360 Model 44 Programming System overlay facilities.

PROGRAMMING SYSTEMS - DAMPS is an extension of the System/360 Model 44 Programming System. The extensions were programmed in the Assembler Language of the system. Application programs can be developed using the FORTRAN and Assembly Languages of the system, with the special features appearing as additions to these languages.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 2044G (128K), one Multiplexer Channel (#5248 or 4598), Priority Interrupt Feature (#5625), High Resolution Interval Timer (#4555), one System Input Device (1442 Model N1, 2501 Model B1 or B2, 2520 Model 1, 2401 Model 1 through 6), one Output Listing Device (1403 Model 2, 3, 7, N1, 1443 Model N1 or any of the above-listed tape units), one Output Punching Device (1442 Model N2, 2520 Model B2 or B3, or any of the above-listed read punches, or any of the above-listed tape units), one Intermediate Storage Area (Second Single Disk Storage Drive (#6415), 2311 Disk Storage Drive, or two of the above-listed tape units).

NOTES CN CONFIGURATION:
1. Any configuration restrictions on the System/360 Model 44 Programming System processors are also restrictions on their use under DAMPS.
2. External Interrupt is not supported. If the 1827 Comparator is wired for External Interrupt, it must use the Priority Interrupt special feature.
3. Sharing channels between real-time and non-real-time devices will degrade the performance of the real-time channel scheduler.
4. Except for console typewriter, devices cannot be shared by both real-time and background jobs.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0537)... Operations Manual (H20-0538).
MACHINE READABLE - The standard system ready for operation is available.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source statements.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX20X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01

360A-CX-21X *M

RAX-REMOTE ACCESS COMPUTING SYSTEM MODEL 44

DESCRIPTION - RAX is a time shared, remote computing system for System/360 Model 44 with the same functional capabilities as RAX for the System/360 Models 30, 40, 50. RAX provides sustained access to a System/360 from remote locations to enable programmers, engineers, scientists, and other users to obtain fast turnaround and reduced problem-solution time for their computational problems.

Users of RAX can submit full USASI FORTRAN IV and Assembler language jobs for compilation and time-sliced execution from local and remote terminals, simultaneously with similar operations at the on-line computer site. Programmers can compile, modify, and execute programs from their terminals while non-computer-oriented users can be conversationally interacting with programs previously saved in the RAX library.

RAX user flexibility is continued on the Model 44 Version by a modular and compatible design. Two memory sizes (128K and 256K bytes) can be used. Two terminals (the IBM 1050 Data Communications Terminal and the IBM 2260 Display

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Station) can be used, with up to a maximum of 63 simultaneously operational. Two IBM Disk Storage Drives are necessary but up to eight can be utilized by RAX. In addition to modularity, RAX flexibility is enhanced by its functional compatibilities being available from the smallest to the largest configurations are-

256K byte memory - Maximum of 63 IBM 1050 Terminals.
- Maximum of 8 IBM 2260 Display Stations.
- Total number of 1050 Terminals and 2260 Display Stations may not exceed 63

128K byte memory - Maximum of 27 IBM 1050 Terminals.
- IBM 2260's can be used with this memory configuration with 1 - 2260 equated to 3.
- 1050's in determining the 27 terminal limit.

- Users may share programs and data which are stored in the RAX user library. File security is provided by means of a lock code, which is used to prevent unauthorized deletion or modification of any file in the library.
- A restart capability is provided for resumption of jobs after recovery from systems error. Upon recovery, RAX will indicate to each user the last line of input accepted, or repeat the last few lines of output.
- The 2260 Display Stations allow entry of up to 12 lines of input at a time. The Non-Destructive Cursor feature is used to provide for single character modification within a line when updating program or data files.
- Object program execution storage of 64K bytes is provided.
- Users of RAX may enter programs and data one line at a time from their terminals, or use a single terminal command to insert a previously stored data or source program module into their job stream at compile time.
- Up to 7 IBM 2311 Disk Storage Drives are supported for on-line library storage.
- The user may enter either FORTRAN or Assembler jobs from his terminals. However, all input/output must be programmed in FORTRAN. Execution of privileged instructions in a user program is not allowed by RAX.
- A display command is available for total or selective listing of a users input or library files.
- A full USASI FORTRAN is provided by FORTRAN IV in 44 RAX.

USE - Sustained access to a System/360 from remote locations enables engineers, scientists, and other users to realize fast turnaround and reduced problem solution time. FORTRAN programmers can compile, modify, and execute programs from their remote terminals, while non-programmers using programs previously saved in the RAX library. Familiarity with the RAX terminal command language and the operation of his terminal device enable the user to exploit the computational power of System/360 in a very convenient manner.

RAX provides a facility for conversational interaction between a user and an executing program. This is accomplished by the use of input/output statements in a problem program which addresses the users terminal as an I/O device. Thus, programs can be written to take advantage of the "on-line" presence of the user by permitting him to selectively modify his input, observe intermediate results as they are calculated, and alter parameters - or perhaps the execution sequence - of the program based on his interpretation of these results.

CUSTOMER RESPONSIBILITIES - A customer using RAX must take the following steps prior to installation to insure that the use of the system will be satisfactory.
- The customer is responsible for ordering and installing satisfactorily the communicatcns equipment required.
- Appropriate training must be given to users on the terminal command language, the programming languages, and terminal operations.
- It is highly recommended that a systems programmer become familiar with the internal operations of the system.
- Distribution of the RAX program will be on tape. RAX users must have access to a tape configuration on which to punch the object and source program decks.

PROGRAMMING SYSTEMS - RAX is written in System/360 Model 44 Assembler Language and includes the FORTRAN IV Compiler and the FORTRAN IV Library.

MINIMUM SYSTEM REQUIREMENTS - System/360 2044 Processing Unit Model G with one multiplexer channel (no.5248) and one high speed multiplexer channel (no. 4598) Floating Point Arithmetic (no. 4427), Store and Fetch Protection features (no. 7531, 7532, 7533); 2540 Card Read Punch, 1403 Printer Model 2, 3, 7, or N1, two 2311 Disk Storage Drives, for attaching 1050 Data Communication Terminals, either a 2702 Transmission Control with Terminal Control

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Type 1 (no. 4615), Selective Speed (no. 9684), and appropriate line adapters or 2701 Data Adapter Units with Terminal Adapter - Type 1 (no. 4645 or 4646) and appropriate line adapter for each line. Up to 27 - 1-5- Data Communication Terminals may be attached to the minimum configuration.

TERMINAL CONFIGURATION - The minimum IBM 1050 Data Communication Terminal consists of one IBM 1051 Control Unit Model 2 with the First Printer Attachment feature (no. 4408) and one IBM 1052 Printer-Keyboard Model 2. The 1052 Printing Element used by RAX is Data 1 Font (no. 9575 or no. 9576). The 1050 can utilize the 1054 Paper Tape Reader or 1056 Card Reader attached as Reader no. 1 on the 1051. For use with the 1056, cards can be prepared on either the 26 or 29 Keypunch. The 1056 must have the Extended Character Read special feature.

The IBM 2260 Display Station must have an Alphameric Keyboard feature and be connected to the multiplexer channel through a directly attached 2848 display control Model 3 with the Non-Destructive Cursor feature. One 2848 Model 3 with up to eight 2260 Display Stations is supported.

The 128K byte core system (processing unit Model G) will support a maximum of twenty-seven 1050's. A tradeoff on core storage will allow one 2260 to replace three 1050's and vice versa, for purposes of calculating the mix of terminal lines entering the system, 600 bytes of memory are required for each 1050 Terminal and 1800 bytes per 2260 Terminal after the basic I/C routines are incorporated.

MAXIMUM SUPPORT CONFIGURATION - System/360 2044 Processing Unit Model H with a multiplexer channel (no. 5248) and two high speed multiplexer channels (no. 4598, 4599), Store and Fetch Protection (no. 7531, 7532, 7533, 7534), Floating Point Arithmetic (no. 4427/, 2540 Card Read Punch, 1403 Printer Model 2,3,7 or N1, eight 2311 Disk Storage Drives, two 2702 Transmission Controls, up to sixty-three 1050 Data Communications Terminals, one 2848 Model 3 Display Control with Non-Destructive Cursor feature (no. 5340, 5341), Channel Adapter (no. 9011), and up to eight 2260 Display Stations with the Alphameric, Keyboard Feature (no. 4766) (with a maximum of 63 - 1050's and 2260's combined), four 2400 9-track tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0565)... Operations Manual (H20-0563).
MACHINE READABLE - Object program load modules and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Option 1 - Source code, and is specified by using Program Number Extension OPT1. Option 2 - Assembly listings, and is specified by using Program Number Extension OPT2.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX21X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	OPT1	MT 9/1600	29	01
		MT 9/800	28	01
	OPT2	MT 9/1600	29	01
		MT 9/800	28	01

360A-CX-26X *M
PROBLEM LANGUAGE ANALYZER (PLAN)

DESCRIPTION - PLAN is a submonitor and application development system that is especially valuable for use with applications that are highly variable in nature and for problem solving and design.

PLAN furnished five closely related program sets that are mutually dependent. These provide the basic PLAN functions; the submonitor... The PLAN input language interpreter... The PLAN input language definer... The PLAN subroutine package for FORTRAN application programmers... The Diagnostic Supervisor.

The PLAN programs for each operating system are written to support a single application development interface. (Each set also allows some desireable, but not-standard operations). As a result, applications may be moved from one environment tc another without change, provided the common interface is adhered to. High level languages offer this kind of support for many purposes. PLAN adds uniform methods of user interaction, data definition, and program structure, in the FORTRAN environment.

Because PLAN was designed to support highly variable

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applications, it offers a new type of modularity. Program linkage definition and intermediate DASD specifications are deferred until execution time, when they can be varied by input data. As a result, much program recoding and re-organization can be avoided.

In further support of this idea, input languages used for application control under PLAN are also defined at the statement level. Both new statement definitions and new program modules can be added to a PLAN application without forcing changes in existing programs and statement definitions.

FEATURES - Free-form input... four levels of input statement hierarchy... user controlled error recovery and diagnostic features... powerful input data options, such as default value, override, algebraic and logical expressions for data values, automatic mode conversion and scaling... dynamic program loading... extensive subroutine support for FORTRAN application programmers.

USE - The problem solver (application user) communicates with PLAN through PLAN statements designed by the user to suit his needs. Each PLAN statement contains a maximum of 450 characters; terminated by a semicolon. Each statement usually contains both a command and data. Processing a PLAN statement causes execution of one or more program modules, using accumulated data and the partial results available at that time. Programmers communicate with the PLAN system to obtain program linkage, error handling, data management and utility functions by entering PLAN subroutines through CALL linkages (normally from FORTRAN).
PROGRAMMING SYSTEMS - PLAN runs under S/360 Disk Operating System (DOS/360); programmed in S/360 Assembly Language and Basic FORTRAN IV. EXCP is used by PLAN for processing of files.

MINIMUM SYSTEM REQUIREMENTS - Model 25, 30, 40, 50, 65, or 75 (background partition of 24K bytes or larger)... all features required for DOS/360 FORTRAN... Floating Point Arithmetic (#4427)... one 2311 Disk Storage Drive with 2841 Storage Control in addition to DOS/360 requirements (total of two disk storage drives).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0594)... Operation Manual (H20-0597).
MACHINE READABLE - Object code, PLAN commands, and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code and listings.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX26X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
		1316	52	01
OPTIONAL	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CX-27X *M
PROBLEM LANGUAGE ANALYZER (PLAN)

DESCRIPTION - PLAN is a submonitor and application development system that is especially valuable for use with applications that are highly variable in nature and for problem solving and design.

PLAN furnishes five closely related program sets that are mutually dependent. These provide the basic PLAN functions; the submonitor... The PLAN input language interpreter... The PLAN input language definer... The PLAN subroutine package for FORTRAN application programmers... The Diagnostic Supervisor.

The PLAN programs for each operating system are written to support a single application development interface. (Each set also allows some desireable, but non-standard operations). As a result, applications may be moved from one environment to another without change, provided the common interface is adhered to. High level languages offer this kind of support for many purposes. PLAN adds uniform methods of user interaction, data definition, and program structure, in the FORTRAN environment.

Because PLAN was designed to support highly variable applications, it offers a new type of modularity. Program linkage definition and intermediate DASD specifications are deferred until execution time, when they can be varied by input data. As a result, much program recoding and re-organization can be avoided.

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In further support of this idea, input languages used for application control under PLAN are also defined at the statement level. Both new statement definitions and new program modules can be added to a PLAN application without forcing changes in existing programs and statement definitions.

FEATURES - Free-form input... four levels of input statement hierarchy... user controlled error recovery and diagnostic features... powerful input data options, such as default value, override, algebraic and logical expressions for data values, automatic mode conversion and scaling... dynamic program loading... extensive subroutine support for FORTRAN application programmers.

USE - The problem solver (application user) communicates with PLAN through PLAN statements designed by the user to suit his needs. Each PLAN statement contains a maximum of 450 characters; terminated by a semicolon. Each statement usually contains both a command and data. Processing a PLAN statement causes execution of one or more program modules, using accumulated data and the partial results available at that time. Programmers communicate with the PLAN system to obtain program linkage, error handling, data management and utility functions by entering PLAN subroutines through CALL linkages (normally from FORTRAN).

PROGRAMMING SYSTEMS - PLAN runs under OS/360 PCP, MFT, or MVT. It is programmed in the S/360 Assembly Language and Basic FORTRAN IV. BDAM, BPAM, and BSAM are used by PLAN for processing of logical files.

MINIMUM SYSTEM REQUIREMENTS - Model 30, 40, 50, 65, 75, 85, or 67 in 65 mode. In addition to OS/360 main and auxiliary storage requirements, PLAN requires 32K or larger partition size for PCP-MFT and 44K or larger for MVT... Floating Point Arithmetic (#4427)... direct access storage space equivalent to the capacity of one 2311 Disk Storage Drive (any DASD supported for system residence may be used) in addition to OS/360 requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0594)... Operations Manual (H20-0596).
MACHINE READABLE - Object code, PLAN commands, and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code. Code is contained as an unloaded PDS created by the OS IEHMOVE Utility.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX27X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360A-CX-32X *M

SYSTEM/360 DECISION LOGIC TRANSLATOR PROGRAM

DESCRIPTION - This program provides an advanced tool needed to translate decision tables into FORTRAN language.

Decision tables are a technique for documenting the logic of a problem and its solution. The concise format of decision tables allows them to present information so that it is easily read and understood, and to present logic simply so that its concepts are readily grasped. The tatular approach is used to express complex decision logic in a manner that encourages the analyst to reduce a problem to its simplest form by arranging and presenting logical alternative courses of action under various combinations of conditions.

The Decision Logic Translator incorporates many logical capabilities and FORTRAN features into the decision table language.

FEATURES -
- The number of tables to translate is not limited, the limit is due to the size of the FORTRAN program which is obtained.
- Tables may contain a mixture of limited and extended entry rows.
- The logical connective between conditions in a rule may be either "AND" or "OR". Both connectives may appear in the same table and rule.
- A variable value may be compared with the values of a singly subscripted array in the condition area of a decision table.
- Arrays with up to three subscripts (FORTRAN limit) may be used.

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- Blocks of FORTRAN arithmetic statements may be defined in addition to the formula statements.
- FORTRAN Features... the use of the specification statements -- DIMENSION, COMMON, EQUIVALENCE and FORMAT... the use of FUNCTION and SUBROUTINE statements... the use of direct access input/output statements -- DEFINE FILE, FIND, READ, WRITE.
- Tape or disk may be used to store the output FORTRAN source statements which will be acceptable input to the FORTRAN compiler for translation into machine language and execution without further manipulation.
- Table with up to 64 columns and 99 condition and action rows can be translated.
- Each main program or subroutine may have up to 20 closed tables.
- There may be up to 99 references to a single closed table.
- The table columns may be 2, 8, or 16 spaces wide depending on the needs of this table.

APPLICATION AREAS:

IN THE MANUFACTURING AND SCIENTIFIC INDUSTRIES

The main applications are for Automated Design Engineering (ADE) and Automated Manufacturing Planning (AMP). These applications represent a precise method and set of tools for studying engineering problems and establishing working computer oriented systems. They both accept customer requirements as input and, through the medium of explicit design logic stored in the computer by means of decision table technique, produce the completed design information for manufacturing. Error-checking, bid and order costing can be incorporated into such systems.

IN THE DISTRIBUTION INDUSTRIES

Decision tables are very useful for credit checking, price computation, and inventory control.

IN THE TRANSPORTATION INDUSTRIES

Decision tables are used to establish automated reservation systems and set prices.

IN THE SERVICE INDUSTRIES

Decision table techniques are used in insurance areas to establish the policy type and the tariffing from a customer request.

Decision tables can be used effectively for systems analysis, procedure design, program debugging, and many varied applications.

Decision tables may also be employed to describe an entire data processing system as well as a portion of the system.

USE - This program is designed primarily for areas concerned with problems having a complex decision logic.

Decision tables are a means of bringing together and presenting the related information to express complex decision logic in a way that is easy to visualize and follow. They can be used independently of, or to complement, flow charts and block diagrams in record keeping, decision-making and problem-solving operations in business, mathematic and the science fields. Decision tables can be used effectively for system analysis, procedure design and documentation. Their use expedites and simplifies the time-consuming functions of problem definition, system analysis programming.

PROGRAMMING SYSTEMS - The program is written in System/360 Assembler Language and operates under the Disk Operating System (DOS). The Standard Instruction Set and Decimal Arithmetic (#3237) are required to assemble the original programs and the Floating Point (#4427) is required to compile the Basic FORTRAN IV source program produced.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model E supported by DOS/360... two 2311 Disk Storage Drives... printer, card reader, and card punch (selected from the set supported by DOS/360... 1052 Printer-Keyboard.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0572)... Operations Manual (H20-0573).
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code, assembly listings and flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX32X

PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT

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BASIC	none	DTR*		00	none
OPTIONAL	none	MT	7DC/800	26	01
		DTR	9/800	28	none
		DTR	9/1600	29	none

360A-CX-34X
PLAN GRAPHICS SUPPORT

DESCRIPTION - PLAN Graphics Support reduces the time and effort required to implement an interface between the IBM 2250 Display Unit and application programs. In most instances, an application programmer may use this system to avoid coding the graphics portion of an application at a FORTRAN or Assembly Language level. The user may rapidly integrate graphic capability into existing and new applications.

A user-oriented statement language has been implemented into PLAN Graphics Support via the facilities provided by PLAN for language definition. By means of the free format language statements and the more conventional fixed format specification cards, the application programmer can specify the graphic displays and interrupt (Light Pen and Keyboards) controls desired by the application user. During the execution of the application, the display console operator may dynamically control his application utilizing the interactive graphic capability of the IBM 2250.

The facilities available to the application user (display console operator via PLAN Graphics Support include:

. GRAPHIC OUTPUT
Data lists from the application program may be displayed in any desired format using points, characters, lines, arcs, circles, etc. --the format and control options being previously defined via language statements and/or specification cards.

. GRAPHIC INPUT

Data may be created or modified at the console and passed to an application program via the Alphameric Keyboard.

. MONITORING AND CONTROLLING THE APPLICATION
The console user dynamically controls subsequent displays and application functions to be executed via the Light Pen, Programmed Function Keyboard, and the Alphameric Keyboard.

FEATURES - Easy-to-use statements for specification of graphic displays and interrupt control... Includes routines for lines, arcs, circles, and conic sections... Special "high speed displays" may be defined giving rapid response to operator interrupts... Built-in default options simplify programming... All PLAN functions and facilities are available to the user... Open-ended system allows user to build additional capability into PLAN Graphics Support... Special routines facilitate maintenance of graphic data.

USE - The application programmer describes the graphic displays and interrupt controls by means of statements and specification cards. These cards are normally used as input to an off-line operation during application development to create and store the files necessary to generate the graphic displays. During the running of the application, the previously stored files are used to generate the displays on the IBM 2250, allowing the console user to communicate with his application. Information flowing between PLAN Graphics Support and the application program pass through FORTRAN COMMON managed by PLAN.

PROGRAMMING SYSTEMS - PLAN Graphics Support is programmed in FORTRAN IV with some Assembler code and requires the following system environments: OS/360... Graphic Program Services for FORTRAN IV (360-LM-537)... PLAN (Problem Language Analyzer (360A-CX-27X).

MINIMUM SYSTEM REQUIREMENTS - S/360 CPU Model 40 with a minimum of 128K memory (90K application partition required). .. One 2250 Model 1 with Absolute Vectors and Control (#1002), Alphameric Keyboard (#1245), Buffer (#1498 or 1499) Character Generator (#1880), Light Pen (#4785), Programmed Function Keyboard (#5855)...

OR

... One 2250 Model 3 with Alphameric Keyboard (#1245), Programmed Function Keyboard (#5855) and 2840 Display Control Model 2. In addition to the I/O units and intermediate storage for OS/360, PLAN, and Graphic Program Services for FORTRAN IV, storage on a DASD is required for:
a. PLAN Graphics Support Load Modules -- approximately 350K bytes.
b. Panels -- approximately 2K bytes per panel (based on an average of 25 specifications per panel).

Access to a tape drive will be necessary for system generation and maintenance.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0614)... Operations Manual (H20-0615).
MACHINE READABLE - Object code, sample job control and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Option 1 - Source statements, and are specified by using Program Number Extension CPT1. Option 2 - Program listings, and is specified by using Program Number Extension OPT2.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX34X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	OPT1	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
	OPT2	MT 9/1600	29	01
		MT 9/800	28	01

360A-CX-42X *N
CALL/360-OS

DESCRIPTION - CALL/360-OS is a time-sharing system which operates under the System/360 Operating System in either an MFT or MVT environment. Because it requires only one partition or region, background jobs may execute concurrently with the CALL/360-OS task.

The CALL/360-OS system (360A-CX-42X) offers the user a problem solving facility based on individual needs and timely availability. The system is designed to enhance the problem solver's capabilities by reducing the elapsed time between porblem definition and problem solution.

The needs of two classes of users, the non-professional as well as the experienced user, were significant considerations in the design of CALL/360-OS. To match a wide spectrum of user problem complexity, the system offers three applications-oriented programming languages: the easy-to-use CALL/360-OS BASIC, the more powerful CALL/360-OS PL/1, and CALL/360-OS FORTRAN.

The CALL/360-OS system provides terminal users with an individualized computing capability which resembles that of a dedicated data processing system. The terminal devices supported by the system are the IBM 2741 Communication Terminal (Correspondence) and the TELETYPE* Model 33/35** or equivalent.

CALL/360-OS is interrup driven, thus operating overhead due to polling is eliminated, and system response time to terminal originated activity is reduced.

For the solution of his particular problem, the user has at his disposal a Terminal Command Language and three programming languages: CALL/360-OS BASIC, CALL/360-OS PL/1 and CALL/360-OS FORTRAN. Since these languages have been designed to operate in a conversational computing environment, implementation differences between the System/3 Operating System languages (PL/1 and FORTRAN) and the CALL/360-OS PL/1 and FORTRAN languages exist. These differences are identified in the language reference manuals.

TERMINAL COMMAND LANGUAGE

The Terminal Command Language is designed to facilitate communications between the terminal user and the computer. It provides commands that permit the terminal user to: Create and modify program files...Define and redefine data files...Save, protect and purge program and data files... Obtain listings of program files... Choose a language processor for compilations... Compile and execute programs.. . Obtain information relative to connect time, CPU time program files and data files...Use routines residing in CALL/360-OS libraries.

Through the Terminal Command Language, the user is able to access those resources within the system which are applicable to his particular computing problem. The language is so structured that the user may concentrate on problem solution and not on the intricacies of the computing machinery.

CALL/360-OS BASIC

The CALL/360-OS BASIC language is based upon the BASIC time-sharing language originally developed at Dartmouth College, Hanover, New Hampshire. This language was specifically designed to be easy to learn and easy to use. It is ideally

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suited for use as a first entry language for new users, and for the occasional user who is not an experienced programmer.

CALL/360-OS PL/1

For more complex programs, the powerful CALL/360-OS-PL/1 language is provided. This language contains features for handling such diverse computing problems as substring processing and array manipulation. CALL/360-OS PL/1 provides the user with many of the features of the full PL/1 language, using the facilities of CALL/360-OS via a remote terminal. The combination of language and system features provides many advantages to the user, including:

- Capability to handle a variety of data types, including: Character Strings and Complex Numeric Data
- Extended array facilities
- Flexible, stream-oriented, input/output facilities, including: listed, data-directed and edit-directed data specification
- A large number of built-in functions
- User-controlled processing of program generated interrupts

CALL/360-OS FORTRAN

FORTRAN is the most wiedly used and known at all higher level, scientific languages and provides language capability in a form convenient and familiar to the scientific/ engineering, technical community. Through CALL/360-OS, a FORTRAN language is made available to this community for use in the computing environment.

PERFORMANCE

CALL/360-OS has been designed to handle the high volume of diverse activity present in a problem solving environment, and to provide the fast response required of an individualized computing system.

As is true in all multiprogramming environments the performance of one task may be impacted by other tasks. CALL/360-OS specifically addresses this situation through internal features such as dynamic relocation of terminal user programs and dynamic reassignment of dispatching priorities. The system provides rapid response for those functions (for example, program statement entry) where fast response is required, while giving lower priority to those functions (for example, extensive calculation) where such response is not required.

Because of the dynamic nature of user problems and the manner in which they are handled, no definitive statement may be made regarding the impact of CALL/360-OS on any other task in the system, or vice versa. For increased performance, however, the CALL/360-OS task must have the highest dispatching priority within OS/360.

FEATURES

- Personal computing system OS/360 MFT or MVT
- Concurrent batch processing capability under OS/360
- Dynamic assignment of dispatching priorities
- Extensive Terminal Command Language

Multiple Languages:

CALL/360-OS BASIC
CALL/360-OS PL/1
CALL/360-OS FORTRAN

Structure designed for problem solving, include:

Terminal check-out of CALL/360-OS programs
Compiler-generated, dynamically relocatable code
Ease of modification of user programs
Multiprogramming within a partition
Paper tape facility to accept source program code as input
Main Storage Hierarchy support to provide segmented operation in either processor storage and/or IBM 2361 Core Storage

USE

The CALL/360-OS system is initiated as a job through the use of OS Job Control Language (JCL) statements. Variations in the configuration of terminals and available libraries may be attained by the inclusion or exclusion of specific data definition (DD) statements at system initialization time.

When the system is in operation, a terminal user may become attached to the system by dialing the computer. If a line is available, his call is automatically answered. The Terminal Command Language provides data and program security from other interactive users of CALL/360-OS, and allows the user to initiate his own terminal activity.

PROGRAMMING SYSTEMS - CALL/360-OS is written in the OS/360 Assembler Language and employs EXCP for all disk I/O operations, and an appendage restart exit for terminal I/O operations. To install CALL/360-OS, the user must have an MFT or MVT system with at least an OS/360 Assembler, the Linkage Editor F, and the OS/360 utilities IEHPROGM and IEHMOVE. There is no direct communication between the

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CALL/360-OS language processors and OS/360. CALL/360-OS is non-refreshable and does not benefit from the hardware error recovery facility offered by OS/360 Model 65 Recovery Management Support. CALL/360-OS does not support the Model 65 Multiprocessing System (M65MP).

MINIMUM SYSTEM REQUIREMENTS - CALL/360-OS is structured to run on an IBM System/360 Model 50 HG and above.

The minimum peripheral equipment for on-line operations is listed below:

- One selector Channel
- One IBM 2314 Storage Control Model A1
- One IBM 2312 Disk Storage Module Model A1
- One IBM 2702 or 2703 Transmission Control Unit
- One Command Console (IBM 2741, TTY 33ASR or TTY 35ASR)
- One Communications Console (IBM 2741, TTY 33ASR or TTY 35RO)

In addition, the following peripheral equipment is needed for off-line operations.

- 1 Printer Output Unit, OS/360 supported, with 132-print positions and graphics equivalent to the PN print arrangement
- 1 Punched Output Unit (See OS/360 minimum requirements)
- 1 Card Input Unit (See OS/360 minimum requirements)

A magnetic tape unit is needed if the user requires the CONVIN function of the U#INITLD utility. Any peripheral devices, in addition to those given above, will be supported within the limits of OS/360 support. Specifically, CALL/360-OS can use additional selector channels and disk storage modules. The use of the RPQ High Resolution Timer gives the most accurate accounting capability. This RPQ is available on the Models 50 (RPQ-E15092) and 65 (RPQ-E43528) central processing units.

The minimum partition or region size required for use of CALL/360-OS is 240K. This allows a configuration of ten lines with BASIC and FORTRAN compilers and an object program size of 70K. A typical BASIC program of 450 statements could be expected to generate 70K of object program.

Additional partition or region space is required for increased terminal networks, the PL/1 compiler, larger programs and for improved performance in a large network environment.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Terminal Operations Manual GH20-0699... Operator's Manual GH20-0788, Executive and Utilities Program Description Manual GH20-0786... CALL/360-OS BASIC Language Reference Manual GH20-0699... CALL/360-OS PL/1 Language Reference Manual GH20-0700... Call/360-OS FORTRAN Language Reference Manual GH20-0710.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Executive Source, Utilities Source, Language Compilers Source and the Language Macros.

ORDERING INFORMATION: PROGRAM NUMBER 360ACX42X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
OPTIONAL	none	MT	7DC/800	26	01
		MT	9/800	29	01
		MT	9/1600	29	01

360A-DP-07X *M
HYPHENATION/360

DESCRIPTION - Consists of control and functional routines that provide for division of words in text-processing applications. This permits the addition of word syllables to meet justification requirements rather than forcing the line to end with the complete word. This hyphenation capability is provided in the form of a module which can be linked with a text-processing program. Through program linkage, HYPHENATION/360 accepts a word up to 63 characters in length from the users program and determines the division points. The word, with the division point or points indicated (based on user option), is returned to the user program where the portion to be retained on a line can be selected as determined by users graphic requirements. The program assumes the burden of all hyphenation decisions, regardless of whether the word to be divided contains alphabetic characters only, or combination of alphabetic characters, numbers, and/or punctuation. A word presented to the program normally consists entirely of alphabetic characters. However, lengthy compound words or phrases,

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alphanumeric words, and words containing punctuation can be divided by HYPHENATION/360.

FEATURES - Modular design concept permits inclusion of HYPHENATION/360 in any user text processing program... broad statistical data base used to generate probabilities implies higher accuracy through a wide range of words... exception word dictionary concept with IBM-supplied utility programs provides ability to tailor HYPHENATION/360 to highly specialized word lists (e.g., legal, medical, scientific)... file and program layout based on statistical analysis that insures faster hyphenation of commonly used words... dual operating mode (i.e., last-to-fit or all-points hyphenation) provides fast throughput coupled with flexibility to accomodate a wide variety of user-required graphic considerations... hyphenation of all words, including those containing numerals, punctuation, special characters, text hyphens, etc. ... system utility programs provide user maintenance and display capability utilizing the logic of this package.

HYPHENATION/360 can be used in conjuction with a text composition program to produce justified and hyphenated lines of text. HYPHENATION/360 accepts a word from the composition program and returns to the composition program the hyphen points for that word. The number of hyphen points picked depends on the mode of operation desired. If all points mode is selected by the composition program then all valid hyphen points in the word are indicated. However, if last-to-fit mode is chosen only one hyphen point closest to the last character in the word to fit is chosen. Two utility programs are also supplied which allow the user to test words for hyphen points and maintain the exception word dictionary. The testing program processes words entered on cards with desired hyphen points indicated. These words are processed through the hyphenation logic and if the computed points are different than those desired, the word is indicated as an exception. These exception cards can then be used as input to the maintenance program which loads them on the exception word dictionary. Using the facilities of these programs the user can insure a high degree of hyphenation accuracy. To build the users exception word dictionary so that it contains the appropriate words, the user should test words that he feels might be exceptions to the hyphenation logic. Excepticns to the hyphenation rules as indicated by the testing program, together with the exception words distributed with the program, are loaded on the exception word dictionary by the maintenance program. As additional words which do not follow the hyphenation logic are encountered, they can be added to the exception word dictionary by using the maintenance program.

PROGRAMMING SYSTEMS - HYPHENATION/360 and its two associated utility programs, the Hyphen Testing Program and Exception Word Maintenance Program, are coded in Assembler Language and operate under the the System/360 Disk Operating System. HYPHENATION/360 will operate with the batch or multiprogramming supervisors of DOS/360 in any of the three partitions. The two Hyphenation Utility Programs are designed to operate in the background. The users text processing environment will determine the Supervisor options and system components required. To assemble and catalog the HYPHENATION/360 and utility program source books, a DOS/360 system including the following components is required -

- System Control and Basic IOCS (360N-CL-453).
- Assembler (360N-AS-465).
- Direct Access Method (360N-IO-454).
- Consecutive Disk IOCS (360N-IO-455).

The following BPS/360 DASD Utility programs are required for retrieving machine readable material -

- Disk to Card (360P-UT-064).
- Disk to Printer (360P-UT-073).

MINIMUM SYSTEM REQUIREMENTS - The minimum machine configuration required for execution of HYPHENATION/360 and its twc associated utility programs includes - System/360 Processing Unit (32K), one card reader (1442, 2501, 2520, 2540), one card punch (1442, 2520, 2540), one printer (1403, 1443), one 2311 Disk Storage Drive, one 1052 Printer-Keyboard. The core residence requirement for HYPHENATION/360 is 11,280 bytes. The minimum processor storage capacity of 32K is dictated by the core requriements of one of the utility programs. Retrieval of machine readable material can be obtained on the minimum configuration with the restriction that the system printer must be a 1403 Printer with 132 print positions. This printer configuration is required for listing flowcharts. It is desirable, but not required, that the printer have a PN or QN chain arrangement (PL/I). If this arrangement is not available, the follcwing four delimiter characters may either not print, or else print as different characters - percent sign, colon, semi colon, and number sign. All components of HYPHENATION/360 can be assembled and link edited on the same minimum configuration with CPU core requirement of only 16K instead of 32K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program

CONTINUED FROM PRIOR CCLUMN

Description Manual, H20-0525... Operations Manual, H20-0626... System Manual, Y20-0208.
MACHINE READABLE - Source statements of the 3 component programs in card image format, basic file of exception words, and system flowcharts along with reference listings.

OPTIONAI PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ADP07X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		MT 9/1600	29	01
		MT 7DC/800	26	01
		1316	52	01
OPTIONAL	none	none		none

360A-DP-08X *M
COMPOSITION/360

DESCRIPTION - This program, in conjunction with a user-supplied program, forms the basis of a comprehensive text-composition system that operates under DOS/360.

The program consists of control and function routines that accept input from a user-prepared disk-resident file. The disk-resident file must contain the copy to appear in print and instructions describing the desired printing format. The program produces a generalized output records and stores them in a specified disk area. These output records contain (1) the original copy in the form of justified lines arranged according to the graphic and stylistic requirements described by the user with the input format instructions and (2) the functional format control information necessary to completely define the printed appearance of the lines. The user must retrieve this generalized information from the disk area, convert it into coding acceptable to the specific composition device on which final printing will occur, and write it to the appropriate systems output device. The input/output processing described must be provided by the user in the form of an input/output generation program. If word division capabilities are required, COMPOSITION/360 is designed to use the HYPHENATION/360 (360A-DP-07X) component program of System/360 Text Processor.

Although COMPOSITION/360 is programmed to run in one partition under DOS/360, it is designed with the intent that the user-supplied input/output generation program occupies the Foreground I partition with COMPOSITION/360 occupying either the Foreground II (if independent user background programs are desired) or Background partition (if in a dedicated text-processing environment). Implementation of an operational System/360 Text Processor, which consists of COMPOSITION/360, HYPHENATION/360 (if required), and a user-supplied input/output generation program, requires two partitions of DOS/360, with the user-supplied program occupying Foreground I. The two partition operational concept for System/360 Text Processor is designed to gain maximum utilization of the multiprogramming features of DOS/360 in effecting maximum program overlap and thruput, while allowing non-related programs in the Background partition to run concurrently with and independently of normal text processing operation.

FEATURES - Two format control languages are supported to allow user flexibility in utilizing maximum capabilities of different composition output devices and to permit the transition of existing 1130 or 1620 Type Composition installations to System/360 with minimum operator training... COMPOSITION/360 is intended to provide functional capabilities which are common to most text composition applications, thus forming the base from which the user can integrate the facilities of System/360 and System/360 Disk Operating System with his specific installation requirements... the composition device-independent output records produced by the program are designed to permit user utilization of the capabilities of a broad range of composition output devices without requiring a separate COMPOSITION/360 program run for each device. This could be advantageous, for example, with a system in which proofing operations are desired on an output device different from the final composition device... COMPOSITION/360 can be used to process text input originating from different system input devices since it is designed to operate independently of I/O facilities; this input media transparency if effected by user code conversion of the input data stream prior to writing it onto the disk file input to COMPOSITION/360.

USE - This component program of System/360 Text Processor consists of control and functional routines that accept input text from a user-prepared disk file, process the text into justified lines according to graphic and stylistic requirements described by the user, and produce generalized output records on disk. The user must write the routines to place input on the file and relieve the generalized

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output records from the file. This enables the user to tailor the system to his own requirements and provides the necessary flexibility for change and growth.

CUSTOMER RESPONSIBILITIES - For a minimum operational system, user responsibility encompasses the following two areas:

1. Write an input/output generation program which tailers COMPOSITION/360 to the user's own input/output requirements. This program includes:

- Routines (1) which select, initiate, and handle reading of textual and format control information from the specific systems input device(s) selected by the user for that function and (2) which place the textual and format where it then becomes input to COMPOSITION/360.
- Routines (1) which relieve the generalized output record from the designated file output area after COMPOSITION /360 processing, (2) tailor the output records to the specific composition device on which the copy is to be printed or displayed, and (3) which select, initiate, and handle the output of tailored device-dependent records to the specific systems output device(s) selected by the user for that purpose.

2. Gather data which controls the graphic and stylistic appearance of the text and which defines the fonts used to justify the text. This data must then be loaded on a disk in a format acceptable to COMPOSITION/360 via utility programs supplied with this package.

PROGRAMMING SYSTEMS - COMPOSITION/360 is written in Assembler Language and operates under control of DOS/360 in a multiprogramming environment. In addition to a Supervisor and System Control and Basic IOCS, the following components are required:

Direct Access Method	360N-IO-454
Disk Sort/Merge	360N-SM-450
Assembler	360N-AS-465

MINIMUM SYSTEM REQUIREMENTS - System/360 Model F Processing Unit (64K bytes) with Decimal Arithmetic, Interval Timer, Storage Protection, and one Selector Channel, 1052 Printer-Keyboard with CPU attachments, 2841 Control Unit, and one 2311 Disk Storage Drive. These components are in addition to DOS/360 requirements of one 2311 Disk Storage Drive, one card reader, one card punch, and one printer. Note that this minimum machine configuration does not include the text input/output system devices necessary to implement an operational text processing system (e.g., magnetic tape, paper tape, data entry terminals, display components, etc.). It is the responsibility of the user to select these components and provide the necessary support programming based on his composition system requirements.

The core residence requirement for COMPOSITION/360 is 30K bytes. The inclusion of HYPHENATION/360 with COMPOSITION/360 does not increase this requirement since HYPHENATION/360 functions as an overlay phase in COMPOSITION/360. The remaining 34K in a minimum system can be used for the DOS Supervisor, the user's input/output generation program, and a user background program. Implementation of a three partition system (user's input/output generation program in Foreground I, COMPOSITION/360 in Foreground II, and user program in Background) in a minimum system is dependent upon the size of user's input/output generation program and the DOS Supervisor needed.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0585)... Operations Manual (H20-0579).
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ADP08X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		MT 7DC/800	26	01
		DTR 9/800	28	none
		MT 9/1600	29	01
OPTIONAL	none	none		none

360A-DR-04X
RETAIL IMPACT FASHION SYSTEM (OS)

DESCRIPTION - This system uses probability science to help the buyer respond quickly to styles performing significantly above or below other similar styles, based on their profitability, and maintenance of complete records at the style level. Appropriate documentation and interfaces are provided for the user who wishes to maintain size and color. This system is designed to initialize and operate

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a complete department. The library program does both the initializing and regular operation. The user does not have to write any programs to use the system. However, the user may desire to modify the operational programs in the fashion reporting area and will probably write additional programs to extend the reports produced by the system.

FEATURES - Automatic recommendations for re-order, return, markdown and transfers based on sophisticated statistical techniques which accurately analyze the potential of a style early in its life... the basic yardsticks used for making recommendations are dynamic class (or group) standards, based on profitability (which reflects the interaction of turnover and markup) to respond to the overall seasonal changes... automatic maintenance of files to replace manual records at the style level... status inquiry at buyer request (vendor status, etc.)... various merchandise management reports can be created from the style master records (aging, stock status, etc.).

PROGRAMMING SYSTEMS - Written in PL/I Level F, and the program is designed to operate under the OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model F30 (65K) with Decimal Arithmetic (3237), Floating Point Arithmetic (4427), 1051 Attachment (7915), 1051 (Model N1, 3130 CPU Attachment (3130), 1052 (Model 8), 1442 Model N1), 1443 (Model N1) with Selective Character Set (6402), and the 63 Character Set Type Bar (9089), 24 Additional Print Positions (5558), 2841, 4-2311 Disk Units, 2415 (Model 1).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual... Operations Manual.
MACHINE READABLE - Source programs with narrative and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ADR04X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360A-DR-05X
RETAIL IMPACT STAPLE SYSTEM (UNDER OS)

DESCRIPTION - This system uses an advanced forecasting subsystem which employs adaptive forecasting, probability, and statistical science with appropriate decision rules to forecast demand, determine order points, and order up to levels. An advanced control subsystem is tailored to the needs of the retail industry. It may be used to create purchase orders, control merchandise on order, and monitor the performance of the system in terms of inventory and level of service.

This system also allows the simulation of a number of management policies, as well as for projecting demand and inventory behavior over an extended period, resulting from a particular policy or set of policies. With this feature, management will be able to establish a priority for departments to be implemented and obtain an estimate of the system's potential in these departments. The system reduces the difficulty of maintaining large inventories in multiple locations, typical of today's retail industry.

Optimum use of the system is achieved through the capture of daily sales information at the point of sale. For those few classes of merchandise or departments where the direct capture of daily SKU data is not feasible, the user may wish to employ stock counts to derive periodic sales.

Appropriate documentation is provided so that the Retail IMPACT Staple System can be used in conjunction with the customer's own stock counting procedures. Certain types of output, such as daily service measurement, cannot be provided if stock counting is employed.

FEATURES - A comprehensive Control Subsystem which provides for automatic recrder of forecasted items and items with ordering parameters specified by store personnel...purchase order creation...vendor lead time control by signaling irregular lead time...generalized transactions which allow for file updating for a group of items with only one input transaction for size, color, style, store and/or department...source records available for additional reports... continual system monitoring of service level, inventory investment and sales...store performance report for each department.

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An advanced Forecasting System which employs adaptive forecasting, probability and statistical analysis for determining trends and seasonal behavior, editing "bad" data, and handling high and low volume items...initial forecasting "models" developed automatically from sales history, buyer estimates, or by adapting models taken from similar items...automatic adjustment of forecasting models, weighted according to currentness of data...signaling of significant variation in item sales patterns...scientifically determined decision rules based on forecasted sales, desired level of service, pack size, etc....forecast model by item, or by group of items.

An advanced Simulation Subsystem which determines the effects of alternative management policies--before and after installation...the ability to anticipate the inventory status at specified intervals during the year, number the value of purchase orders placed, and expected level of service...analysis of vendor lead times including averages, deviations, correlations with quantity ordered and season.

PROGRAMMING SYSTEMS - Designed to operate under OS/360, PI/I Level F.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model G40 (128K) with Decimal Arithmetic (#3237)...Floating Point Arithmetic (#4427)...1052 Adapter (#7920)...1052 Printer-Keyboard Model 7...1442 Card Read Punch Model N1... 1443 Printer Model N1 with Selective Character Set (#6402) and the 63 Character Set Type Bar (#9089) (Users ordering a 1403 Printer will require a QN2 or PN2 Print Train)...24 Additional Print Positions (#5558)... 2841 Storage Control...4-2311 Disk Units... 2415 Tape Unit Model 1.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description Manual (H20-0591)...Operations Manual (H20-0593).
MACHINE READABLE - Source code, narrative, sample problem and flowcharts.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ADR05X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360A-DR-07X
IBM INPUT CONVERSION PROGRAM

DESCRIPTION - The IBM Input Conversion Program translates cut-form document information from the IBM 1287 Optical Reader into computer processable data. It is designed to enable a user to utilize the IBM 1287 Optical Reader in implementing input-conversion in an efficient and economical manner without the need of additional programming. The input-conversion process is an essential link between the information coming from the multitudes of data sources and its utilization in an integrated data processing system. Up to 9,998 document types, recorded with a variety of fonts including handprinting, can be processed by the program during the same processing run.

Documents in the same processing run must be the same physical size. To increase effective throughput, the program will verify algebraic sums and self-check digit protected fields which use standard modulo-10 arithmetic or any user specified modulo-10 or 11 arithmetic. It will optionally perform single character reconstructions if one unreadable character occurs in any column of an algebraic summation or in self-check digit protected fields. This will significantly reduce the number of documents that would otherwise be rejected for manual inspection and correction. The user provides specifications relating to the format, processing, and disposition of transactions. These are written in simple notation and punched into control cards. From this information, the IBM Input Conversion Program will generate a unique document processing module. During processing, each acceptable transaction is posted to magnetic tape and error transactions are recorded on a direct access file. For each error document a Correction Turnaround Document is produced noting the error field(s). Corrections are handprinted directly on this form which after re-introduction into the system will relieve the direct access file of the error record for posting to the magnetic tape.

There are two programs, a transaction specification compiler and an operational processor. The compiler accepts, for each document type, description of document fields and their logical relationships from control cards. The output is a document module in Assembler Language which is then assembled and catalogued. The processor, combined with these document modules performs the actual data processing.

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FEATURES -

- A user oriented "language" which can eliminate the programming for the IBM 1287 Optical Reader.
- The Input Conversion Program is generally applicable in many areas.
- Verification and reconstruction techniques are used.
- User routines may be included in the application program.
- The Correction Turnaround Document provides control and audit trial and pinpoints source of errors. It also facilitates corrective action.
- Many document types may be intermixed in a processing run.

PROGRAMMING SYSTEMS - The program is written in System/360 FORTRAN and Assembler Language. It is designed to work with and use the IBM System/360 Disk Operating System. Also required are the Direct Access Method, Consecutive Tape IOCS, and Optical Character Reader IOCS (1285/1287).

MINIMUM SYSTEM REQUIREMENTS - 1287 Optical Reader (Model 1), Numeric Handprinting (No. 5370), RPQ No. 843149 (No charge; utilizes @ character for core storage representation of unrecognizable characters). A 2030 Processing Unit, Model F30 (64K) with Decimal Arithmetic (No.3237), 1051 Attachment (No. 7915), 1051 Control Unit (Model N1), 1052 Printer-Keyboard, 1442 Card Read Punch (Model N1), 1403 Printer (Model N1, Interchangeable Train Cartridge-Specify 1428 Font AN4-9621 or ASCSOCR), 2841 Storage Control, two 2311 Disk Storage Drives, 2415 Magnetic Tape Unit and Control (model 1). Core Utilization (excluding DOS resident supervisor) - Compiler - 54.5K, Processor - 19.5K plus approximately (44 x N bytes where N is the number of fields in a document) summed for each document type to be used in a run.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual, H20-0527... Operations Manual, H20-0528.
MACHINE READABLE - Object program modules.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360ADR07X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360A-DR-08X *M
RETAIL IMPACT FASHION SYSTEM

DESCRIPTION - This system uses probability science to help the buyer respond quickly to styles performing significantly above or below other similar styles, based on their profitability, and maintenance of complete records at the style level. appropriate documentation and interfaces are provided for the user who wishes to maintain size and color. This system is designed to initialize and operate a complete department. The library program does both the initializing and regular operation. The user does not have to write any programs to use the system. However, the user may desire to modify the operational programs in the fashion reporting area and will probably write additional programs to extend the reports produced by the system.

FEATURES - Automatic recommendations for re-order, return, markdown and transfers based on sophisticated statistical techniques which accurately analyze the potential of a style early in its life... the basic yardsticks used for making recommendations are dynamic class (or group) standards, based on profitability (which reflects the interaction of turnover and markup) to respond to the overall seasonal changes... automatic maintenance of files to replace manual records at the style level... status inquiry at buyer request (vendor status, etc.)... various merchandise management reports can be created from the style master records (aging, stock status, etc.).

PROGRAMMING SYSTEMS - Written in PL/I and the program is designed to operate under the DOS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model F30 (65K) with Decimal Arithmetic (3237), Floating Point Arithmetic (4427), 1051 Attachment (7915), 1051 Model N1, 3130 CPU Attachment (3130), 1052 Model 8, 1442 Model N1, 1443 Model N1 with Selective Character Set (6402) and the 63 Character Set Type Bar (9089), 24 Additional Print Positions (5558), 2841, 4-2311 Disk Units, 2415 Model 1.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual, H20-0540... Operations Manual, H20-0541.
MACHINE READABLE - Source programs with narrative and sample problem decks.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None
MACHINE READABLE - Flowcharts

ORDERING INFORMATION: PROGRAM NUMBER 360ADR08X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360A-DR-09X
RETAIL IMPACT STAPLE SYSTEM (UNDER DOS)

DESCRIPTION - This system uses an advanced forecasting subsystem which employs adaptive forecasting, probability, and statistical science with appropriate decision rules to forecast demand, determine order points, and order up to levels. An advanced control subsystem is tailored to the needs of the retail industry. It may be used to create purchase orders, control merchandise on order, and monitor the performance of the system in terms off inventory and levle of service.

This system also allows the simulation of a number of management policies, as well as for projecting demand and inventory behavior over an extended period, resulting from a particular policy or set of policies. With this feature, management will be able to establish a priority for departments to be implemented and obtain an estimate of the system's potential in these departments. The system reduces the difficulty of maintaining large inventories in multiple locations, typical of today's retail industry.

Optimum use of the system is achieved through the capture of daily sales information at the point of sale. For those few classes of merchandise or departments where the direct capture of daily SKU data is not feasible, the user may wish to employ stock counts to derive periodic sales.

Appropriate documentation is provided so that the Retail IMPACT Staple System can be used in conjunction with the the customer's own stock counting procedures. Certain types of output, such as daily service measurement, cannot be provided if stock counting is employed.

FEATURES - A comprehensive Control Subsystem which provides for automatic reorder of forecasted items and items with ordering parameters specified by store personnel...purchase order creation...vendor lead time control by signaling irregular lead time...generalized transactions which allow for file updating for a group of items with only input transaction for size, color, style, store and/or department...source records available for additional reports...continual system monitoring of service level, inventory investment and sales...store performance report for each department.
An advanced Forecasting System which employs adaptive forecasting, probability and statistical analysis for determining trends and seasonal behavior editing "bad" data, and handling high and lcw volume items...initial forecasting "models" developed automatically from sales history, buyer estimates, or by adapting models taken from similar items... automatic adjustment of forecasting models, weighted according to currentness of data...signaling of significant variation in item sales patterns...scientifically determined decision rules based cn forecasted sales, desired level of service, pack size, etc. ...forecast model by item, or by group of items.

An advanced Simulation Subsystem which determines the effects of alternative management policies--before and after installation...the ability to anticipate the inventory status at specified intervals during the year, number and value of purchase orders placed and expected level of service...analysis of vendor lead times including averages, deviations, correlations with quantity ordered and season.

PROGRAMMING SYSTEMS - Designed to operate under DOS/360, PL/I.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model G40 (Control subsystem 65K plus forecasting and simulation 131K subsystems) with Decimal Arithmetic (#3237)...Floating Point Arithmetic (#4427)...1052 Adapter (#7920)... 1052 Printer-Keyboard Model 7...1442 Card Read Punch Model N1...1443 Printer Model N1 with Selective Character Set (#6402) and the 63 Character Set Type Bar (#9089) (Users

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ordering a 1403 Printer will require a QN2 or PN2 Print Train)...24 Additional Print Positions (#5558)... 2841 Storage Control...4-2311 Disk Units...2415 Tape Unit Model 1.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description Manual (H20-0599)...Operation Manual (H20-0592).
MACHINE READABLE - Source code, narrative, sample problem and flow charts.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ADR09X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360A-DW-05X *M
IBM SYSTEM/360 WHOLESALE IMPACT PROGRAM LIBRARY

DESCRIPTION - The IBM System/360 Wholesale IMPACT Program Library offers System/360 users the opportunity to use the IMPACT System of Inventory Management now in wide use among 1400-1311 systems users (1401/1440/1460). The IBM IMPACT (Inventory Management Program and Control Techniques) system of scientific inventory management provides the warehouse distributor (or any organization with the same inventory control characteristics) with the information of "when" and "how much" to buy for each inventory item controlled by the system. It does this through the means of probability science in conjunction with the many factors influencing the distributors inventory control decisions. Factors considered include - lead time, lead time variability, forecast demand, forecast error, service desired, inventory carrying costs, purchasing/receiving costs, discount structures, minimums, maximums, shelf lives, and pack sizes. The "when" and "how much" answers find the most efficient balance between the cost of carrying inventory, cost of purchasing and receiving, discounts realized, and customer service requirements. The System/360 IMPACT includes the IBM System/360 Wholesale IMPACT Program Library and a number of IBM and customer education classes and manuals. The System/360 Wholesale IMPACT Program Library enables the distributor who has an IBM System/360 Data Processing System (Model 30 or greater) to successfully implement an IMPACT inventory management system with minimum effort and expense. Programs are included that perform in the following functional areas - editing, file initialization, estimating, and the control of independent and joint replenishment ordering.

FEATURES - The System/360 Program Library performs the same functions as the existing 1440-1311 program libraries:

- Edit all input for format.
- Screen historical demands for promotions.
- Determine the forecast model (horizontal, trend, horizontal-seasonal or trend-seasonal).
- Determine the ordering strategy to be used and calculate order quantity or order frequency as appropriate for strategy selected.
- Calculate for each item the safety factor required for a prescribed level of customer service.
- Calculate initializing values required for forecast and order models selected.
- Estimate, in advance, results to be expected from applying the rules and values developed.
- Determine when to order items and item groups to meet service objectives after the system is operational.
- Calculate the product mix to be ordered within an item group that will meet both service objectives and limitations on total size of order.

In addition, the System/360 Program Library has included within it a set of macro routines which assist the user in the preparation of distribution-by-value reports and in the creation of operating programs, particularly in the area of forecasting and order point calculation.

These macro routines are -

DBVI	Distribution-by-Value, Pass 1
DBV2	Distribution-by-Value, Pass 2
FCST	Forecast
IBTA	Lead Time Variability and Time to Beta Power
MAXA	Maximum Available
OPPP	Order Point and Peek Point
EOG	Economic Order Quantity
SRBI	Smooth and Rotate Base Index

In addition, the System/360 programs provide increased flexibility in the type of input/output devices used.

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Both input and output of main data flow in all programs may be by disk or tape. An additional card to input file and/or output file to card option is available and can be specified at run time. Either 1442 or 2540 Card Read Punch and 1443 or 1403 Printer may be specified by the user.

For maximum compatibility with IMPACT Systems developed by present users, all input and output formats are identical to those of the 1400-1311 program libraries. The Program library includes both initializing programs and operating programs. Initializing programs are designed to be used once to set up an IMPACT system, then periodically (at least once a year), or, as required, to meet changing conditions. A complete set of programs is provided to perform necessary initializing functions. Operating programs are used in the day-to-day control of the IMPACT system (forecasting and ordering). Library programs are provided to control the ordering of both independent and joint vendors. Because requirements vary widely, the user writes his own programs to perform record-keeping, forecasting, reviewing (if he elects to use an order-point or peek-point approach), ordering follow-up (preparing purchase orders, status listings, etc.), and linkage between his programs and IMPACT library programs. To guide the user in developing his own programs with minimum effort, the IMPACT package provides flowcharts of typical forecasting and review systems.

PROGRAMMING SYSTEMS - Programs in the System/360 Wholesale Impact Program Library are written in Assembler Language and operate under control of the Basic Operating System/360, Disk Operating System/360 or the Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - For use with BOS/360 and DOS/360 - a 16K System/360 Model D30 with Decimal Arithmetic, 1442 or 2540 Card Read Punch, 1443 or 1403 Printer, and either two 2311 Disk Drives or one 2311 and two magnetic tape drives. For use with OS/360 - the OS/360 Wholesale Impact Program Library requires the Decimal Arithmetic option. With conservative blocking factors, the minimum main storage requirement does not exceed 18K bytes. In addition to the standard system residence, space is required in auxiliary storage for -- up to three input data sets... two output data sets... plus print output... and one or two intermediate data sets... requiring an additional DASD or two magnetic tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Application Description, H20-0173... Users Manual, H20-0255... Operators Manual, H20-0256... System Manual.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ADW05X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-EM-04X
MECHANSIM DESIGN SYSTEM - KINEMATICS

DESCRIPTION - This program provides the capability to analyze a wide variety of two and three-dimensional linkages.

MDS offers the mechanical engineer and mechanism designer a powerful, easy-to-use program for analyzing linkages. The system performs the kinematic analysis of two and three-dimensional, simple or complex mechanical linkage systems which may use any combination of six lower pair types. The linkage mechanism to be analyzed is described in a simple problem descriptive language. From the user's description and metric data about the linage, the problems will solve the position and motion of the linkage. The format of computed results varies depending on the system configuration. Tabulations of selected results are possible.

Linkage modifications are made readily with the problem language command set furnished with the system. Mathematical procedures are coded in FORTRAN and use vector analysis, which permits direct solution.

FEATURES - Provides for the kinematic analysis of a wide variety of two and three-dimensional linkages... Provides position of bodies in a mechanism defined by a number of points... Provides a command structure which is easy for the engineer to learn and use... Enables the engineer to quickly ascertain the effect of physical linkage modifications... The printed or plotted output is flexible.

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CUSTOMER RESPONSIBILITIES - A basic knowledge of kinematic analysis is required. The user must be capable of choosing the correct linkage configuration and dimensions which result in a feasible mechanism. The system will provide diagnostics for mechanisms which are under or over constrained. In addition, mechanisms which have a limited range of operation will cause a message to be generated if the input causes the mechanism to move into this range. The customer must be able to interpret the results furnished to properly evaluate his design. The customer must modify the program if further results are required which cannot be generated by the system.

USE - MDS is controlled by user written commands that describe the problem to be processed. A digital model of the linkage is created from the user's description in disk working storage. This digital model forms the basis for the processing phases which are position and motion solution. Motion solution includes velocity and acceleration analysis. Plots of selected calculated results are available with the optional plotting equipment for the 1130 system.

PROGRAMMING SYSTEMS - Written in basic FORTRAN IV and operates under the Problem Language Analyzer (PLAN) program (360A-CX-27X) for OS/360 which in turn operates under the Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Models supported by OS/360. In addition to the S/360 main and auxiliary storage required by OS/360 and the DAS used by PLAN, MDS-Kinematics requires a 100K minimum partition or region and three million bytes of Direct Access Storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0617)... Operations Manual (H20-0618).
MACHINE READABLE - Object code, MDS phases and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Option 1 - Source code for MDS, and is specified by using Program Number Extension OPT1. Option 2 - Compilation listings, and are specified by using Program Number Extension OPT2.

ORDERING INFORMATION: PROGRAM NUMBER 360AEM04X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	OPT1	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
	OPT2	MT 9/1600	29	02
		MT 9/800	28	02

360A-EM-05X *M
MECHANSIM DESIGN SYSTEM - KINEMATICS

DESCRIPTION - This program provides the capability to analyze a wide variety of two and three-dimensional linkages.

MDS offers the mechanical engineer and mechanism designer a powerful, easy-to-use program for analyzing linkages. The system performs the kinematic analysis of two and three-dimensional, simple or complex mechanical linkage systems which may use any combination of six lower pair types. The linkage mechanism to be analyzed is described in a simple problem descriptive language. From the user's description and metric data about the linage, the problems will solve the position and motion of the linkage. The format of computed results varies depending on the system configuration. Tabulations of selected results are possible.

Linkage modifications are made readily with the problem language command set furnished with the system. Mathematical procedures are coded in FORTRAN and use vector analysis, which permits direct solution.

FEATURES - Provides for the kinematic analysis of a wide variety of two and three-dimensional linkages... Provides position of bodies in a mechanism defined by a number of points... Provides a command structure which is easy for the engineer to learn and use... Enables the engineer to quickly ascertain the effect of physical linkage modifications... The printed or plotted output is flexible.

CUSTOMER RESPONSIBILITIES - A basic knowledge of kinematic analysis is required. The user must be capable of choosing the correct linkage configuration and dimensions which result in a feasible mechanism. The system will provide

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diagnostics for mechanisms which are under or over constrained. In addition, mechanisms which have a limited range of operation will cause a message to be generated if the input causes the mechanism to move into this range. The customer must be able to interpret the results furnished to properly evaluate his design. The customer must modify the program if further results are required which cannot be generated by the system.

PROGRAMMING SYSTEMS - Written in basic FORTRAN IV and operates under the IBM Problem Language Analyzer (PLAN) program (360A-CX-26X) for DOS/360, which in turn operates under the Disk Operating System.

MINIMUM SYSTEM REQUIREMENTS - S/360 models supported by DOS, all features required by DOS, plus Floating Point Arithmetic. In addition to main and auxiliary storage required by DOS and the DAS required by PLAN, MDS requires a 56K background partition and one additional 2311.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0617)... Operations Manual (H20-0618).
MACHINE READABLE - Object code, MDS phases and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Option 1 - Source code for MDS, and is specified by using Program Number Extension OPT1. Option 2 - Compilation listings, and are specified by using Program Number Extension OPT2.

ORDERING INFORMATION: PROGRAM NUMBER 360AEM05X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
OPTIONAL	OPT1	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
	OPT2	MT	9/800	28	01
		MT	9/1600	29	01

360A-EO-15X
PROGRAM FOR OPTICAL DESIGN/II (POSD/II)

DESCRIPTION - POSD/II contains as a subset the analysis, evaluation, and optimizations functions of the 1130 POSD. POSD/II extends this application to S/360 users and offers improved performance to customers who have added core and disk drives to their 1130 systems.

POSD/II consists of an interrelated set of programs providing a complete facility for the geometric analysis of image-forming optical systems, together with a means for automatically correcting such systems. The program has the capacity to analyze systems containing prisms, toric surfaces and diffraction gratings in addition to refracting or reflecting elements. The designer has access to outputs such as spot diagram information, radial energy distribution and geometric frequency response tables.

FEATURES -
- Maintenance of 30 surfaces in core.
- Thorough set of utility options.
- Ray tracing speeds of .10 sec./ray surface.
- Enhanced energy distribution and frequency response data presentation.
- Vignetting control by ray aiming option.
- Energy distribution by 5% energy increments.
- Automatic design - Index and dispersion variables... Boundary condition controls... Maximum of 20 variables.

USE - The program is under control of the designer through user written commands. These commands provide data and bring into core the program modules necessary for the required problem solution. In automatic design, the program accepts as input target values and parameters. The program is iterative in this mode. If no solution can be found, the designer may set new targets.

CUSTOMER RESPONSIBILITIES - The customer must produce his own required lens library and glass tables. Utility programs assist him in this task.

PROGRAMMING SYSTEMS - Written in basic FORTRAN IV and operates under the IBM Problem Language Analyzer (PLAN) for OS/360 which in turn operates under Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - System/360 models supported by OS/360. In addition to the S/360 main and auxiliary storage required by OS/360 and the DASD used by PLAN, POSD/II requires a 100K minimum partition or region and two million

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bytes of DASD.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0577)... Operations Manual (H20-0578).
MACHINE READABLE - Object code, sample job control cards and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360AEO15X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
OPTIONAL	none	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none

360A-EO-16X *M
PROGRAM FOR OPTICAL SYSTEM DESIGN/II (POSD/II)

DESCRIPTION - POSD/II contains as a subset the analysis, evaluation, and optimizations functions of the 1130 POSD. POSD/II extends this application to S/360 users and offers improved performance to customers who have added core and disk drives to their 1130 systems.

POSD/II consists of an interrelated set of programs providing a complete facility for the geometric analysis of image-forming optical systems, together with a means for automatically correcting such systems. The program has the capacity to analyze systems containing prisms, toric surfaces and diffraction gratings in addition to refracting or reflecting elements. The designer has access to outputs such as spot diagram information, radial energy distribution and geometric frequency response tables.

FEATURES -
- Maintenance of 30 surfaces in core.
- Thorough set of utility options.
- Ray tracing speeds of .10 sec./ray surface.
- Enhanced energy distribution and frequency response data presentation.
- Vignetting control by ray aiming option.
- Energy distribution by 5% energy increments.
- Automatic design - index and dispersion variables... Boundary condition controls... Maximum of 20 variables.

USE - The program is under control of the designer through user written commands. These commands provide data and bring into core the program modules necessary for the required problem solution. In automatic design, the program accepts as input target values and parameters. The program is iterative in this mode. If no solution can be found, the designer may set new targets.

CUSTOMER RESPONSIBILITIES - The customer must produce his own required lens library and glass tables. Utility programs assist him in this task.

PROGRAMMING SYSTEMS - Written in basic FORTRAN IV and operates under the IBM Problem Language Analyzer (PLAN) for DOS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 models supported by DOS/360. In addition to the main and auxiliary storage required by DOS and the DASD required by PLAN, PODS/II requires a 56K background partition and one additional 2311 Disk Storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0577)... Operations Manual (H20-0578).
MACHINE READABLE - Object code, sample job control cards and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360AEO16X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
OPTIONAL	none	DTR	9/1600	29	none
		DTR	9/800	28	none

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DTR	7DC/800	26	none

360A-FE-15X *N

DEMAND DEPOSIT ACCOUNTING

DESCRIPTION - The Demand Deposit Accouting application program gives support to commercial banks using System/360. The objective of the application program is to meet the customers programming requirements for installing Demand Deposit Accounting. The program package covers three areas - demand despsit accouting, analysis, and conversion.

Demand Deposit Accounting - The application accepts transactions in the form of MICR documents or punched cards, converts these transactions to disk storage, and sorts the transactions into sequence for processing. The transaction file is run against a stop-hold file and stop-hold suspects are recorded in disk storage. Control totals are added to the transaction file and high volume activity summarized. This edited and summarized transaction file is used to post to customer accounts. During posting, a trial balance or journal trial balance is prepared. Exception conditions are recorded on disk storage in the reports file. At the completion of posting, todays transactions file is merged with an accumulated transaction file. Statements are cycled and printed in any of three optional print formats. Eight exception reports are printed from the reports file. A ledger control recap report is included as a separate report.

Analysis - The optional analysis processing accumulates a history file of balance and transaction activity for selected accounts. Included are programs to create, periodically reorganize, and update this file. The analysis report program prepares, on user request, a comparative analysis of accounts or groups of accounts; its use is optional.

Conversion - The conversion processing portion of the application program package provides programs to assist users in the creation of initial data files (balances and names and addresses). These programs accept as input - (1) the Name and Address File tapes and Balance File tape formatted as used by the 1401 Demand Deposit Accounting Application Program, 1401-FB-01X; and (2) 1311 Master File as formatted by the 1440 Demand Deposit Accounting Applications Programs, 1440-FB-03X.

FEATURES -

- All processing can be accomplished on a multi-bank basis. In multi-bank processing, the data for all banks is processed through one application program before proceeding to the next.
- All accounting controls are organized together on a single report printed daily.
- Data for single and related groups of accounts may be collected, organized into an historical file and processed to determine account profitability. A comparative report based on flexible criteria is printed on demand.
- The account balance file is organized so that future inquiry can be accomplished without requiring extraordinary disk drive capacity. Approximately 48,000 accounts are recorded on one 1316 Disk Pack.
- The account name and address file is organized to keep significant data only. This reduces disk pack requirements and speeds throughput.
- The IBM 1419 and 1412 Magnetic Character Readers are programmed to operate in conjunction with 8K Basic Operating System.
- A generalized service charge calculation routine is provided. This routine will meet all the requirements for many users and provide a guide for those which require additional programming.
- The programs contain a series of options at both the overall system and the individual bank level. Among them are -- 3 reader sorter distribution routines... 2 self check account number routines... the ability to maintain the Stop-Hold file in both disk and cards... provision for a 2-up trial balance or a combined trial balance - transaction journal... flexible overdraft policy criteria... 3 formats of customer statements... 4 criteria for statement selection.

PROGRAMMING SYSTEMS - The following features of the IBM System/360 Basic Operating System (System Release 8) are used -

- Basic Control Program 360B-CL-302.
- Input Output Control System (IOCS).
- Consecutive Processing (DTFSR) 360B-IO-303.
- Index and Sequential File Management System ISFMS) 360B-IO-304.
- IBM Basic Operation System/360 Sort/Merge Program 360B-SM-308.
- IBM Basic Operating System/360 Assembler with I/O Macros 360B-AS-309.
- IBM Basic Operating System/360 Utilities, Group I 360B-UT-300.
- IBM System/360 Basic Programming Support Utility

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Program Initialize Disk 360P-UT-069
- IBM 1401/1440/1460 AUTOCODER (on disk) 1401-AU-008.

MINIMUM SYSTEM REQUIREMENTS - Many system configurations are possible. All, however, must include - a 2030 Model D or 2040 Model D Processing Unit with Decimal Arithmetic (No. 3237), Selector Channel (No. 6960), 1051 Attachment (No. 7915), 1051 Control Unit (Model N1), 1052 Printer-Keyboard, Processor Attachment (No. 3130), Adapter for First Punch (No. 3410), Adapter for First Reader (No. 4411), 2841 Storage Control Reader, three 2311 Disk Storage Drives, one reader punch selected from 1442 Card Read Punch (Model A1), or one reader and one punch selected from 2501 Card Reader (Model B1 or B2), 2520 Card Punch (Model B2 or B3), 1442 Card Punch (Model N2), one printer and the associated control unit if the latter is required - 1403 Printer (Models 2, 3, or N1) with 2821 Control Unit (Models 1, 2, 3, 5, and 1416 Interchangeable Train Cartridge), or 1443 Printer (Model N1) with 24 Print Positions Additional (No. 5558), Selective Character Set for 13 Character Bar (No. 6402), and Preferred Character Set feature (No. 9562 or 9564), one Magnetic Character Reader with attachment 1412 Magnetic Character Reader with 7720 Adapter or 1419 Magnetic Character Reader with 7720 Adapter.

The conversion of 1440 combined master file program requires the following machine configuration or its equivalent in S/360 with compatibility. One 1441 Processing Unit (Model A4), one card reader and associated control unit, one 1311 Disk Storage Drive and Disk Storage Control Unit (No. 3321), two 7335 Magnetic Tape Units and 7802 Tape Adapter.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Application Description Manual, E20-0246... Programmers Manual, H20-0263... Operators Manual, H20-0262... Sample Problem Manual.
MACHINE READABLE - Assembler Language source decks, object decks (some utility functions), sample problem job control decks, sample problem data decks, 1440 AUTOCODER source deck.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - System Manual
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360APB15X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360A-FE-16X *N

ON-LINE TELLER PROGRAM WITH MORTGAGE LOAN BACKGROUND CAPABILITY

DESCRIPTION - Performs the basic accounting normally associated with teller activity at the savings window. It accepts entries from the 1060 system, maintains depositors records on 2311 disks, responds to the teller terminal tape or the passbook, accumulates teller totals, and develops a journal of savings transactions. It keeps control totals which, with teller totals and the journal, make possible a daily audit of the depositors records. The program contains its own supervisor. some parts of the program are kept on disk and brought intc core when needed. Teller totals and a journal of transactions are developed on the same disk. Customer accounts are maintained on a separate disk pack. The programs furnished are - Master File Conversion, On-Line Processing, and File Reorganization.

PROGRAMMING SYSTEMS - Source language is System/360 Assembler. The following programs are required for program assembly and use with the conversion and reorganization programs - 360B-CL-302, 360B-IO-303, 360B-UT-300, 360B-UT-301, 360E-AS-309, 360E-UT-069.

MINIMUM SYSTEM REQUIREMENTS - On-Line Teller without background capability requires a 2030 Model E (32K) to handle up to 44 subchannels. In addition to real time savings accounting, the user will be able to perfcrm limited concurrent peripheral operations such as card to disk, disk to printer, and disk to card. Alternatively, the program without background capability will handle up to 16 subchannels in a 16K system (concurrent peripheral operation capability is not available in the 16K program). On-Line Teller with Background Mortgage Processing Capability has the capability of running batch type mortgage lcan processing as background to the S/360 On-Line Teller

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System utilizing the S/360 Mortgage Loan Program. This program can handle up to 16 subchannels on a 2030 Model E (32K) or up to 44 subchannels on a 2030 Model F (65K).

For 32K capability a maximum of 44 subchannels... 2030 Processor with Decimal Arithmetic, Interval Timer, Storage Protection, Selector Channel, Console Typewriter, 1060 and/or 1050 Terminals as required to a maximum of 88... 2701 (from 1 to 4 subchannels) Terminal Adapter Type I (one per line), Expansion Features (one for each line beyond one), Expanded Capability (one for lines 3 and 4), Line Adapter (one per line)... or one 2702 (from 1 to 31 subchannels) or two 2702 over 31 subchannels, Terminal Control Type I (one per 2702), Line Adapters (one per line), 31 Line Expansion Feature (one per 2702 with more than 15 lines)... two* 2311 Disk Storage Drives, 2841 Storage Control.

* When using concurrent peripheral operation you must have an additional 2311 Disk Drive for this purpose and the system must be 32K Minimum.

Devices supported by concurrent peripheral operations include -- 2821 Control Unit (required), 2540 Model 1, 1403 Models 2, 3, 7, N1, 1443 Model N1.

For 16K capability a maximum of 16 subchannels... 2030 Model D with Decimal Arithmetic, Interval Timer, Storage Protection, selector channel, console typewriter, 1060 and/or 1050 terminals as required to a maximum of 32... 2701 (from 1 to 4 subchannels), Terminal Adapter Type I (one per line), Expansion features (one for each line beyond one), Expanded Capability (one for lines 3 and 4), Line Adapter (one per line) ... or 2702 (from 1 to 31 subchannels), Terminal Control Type I, Line Adapters (one per line), 31 Line Expansion Feature (one per 2702 with more than 15 lines), two 2311 Disk Storage Drives, 2841 Storage Control.

For the background Mortgage Loan Processing the system requirements are --

	Number of Subchannels	
	16	44
2030 Processor with Decimal Arithmetic		
Model E	X*	
Model F		X*
Interval Timer	1	1
Storage Protection	1	1
Selector Channel	1	1
Console Typewriter	1	1
1060 and/or 1050 Terminals to a maximum of	32	88
2701 (from 1 to 4 subchannels) Terminal Adapter Type I	one per line	
Expansion Features	one per line beyond one	
Expanded Capability	one for lines 3 and 4	
Line Adapter	one per line	
OR		
2702 (from 1 to 31 subchannels)	1	2
Terminal Control Type I	1	2
LINE ADAPTERS	none per line	
31 Line Expansion Feature	one per 2702 with more than 15 lines	
2311 Disk Storage Drive	4**	4**
2841 Storage Control	1	1
EITHER***		
2540 Card Read Punch	1	1
1403 Printer Model 1	1	1
2821 Control Unit Model 1	1	1
OR***		
1442 Card Read Punch Model N1	1	1
1443 Printer Model N1 (standard 52 character)	1	1

* Includes additional storage required to support Background Mortgage Processing.
** 2 for S/360 On-Line Teller plus 2 for S/360 Mortgage Loan.
*** Required by the S/360 Mortgage Loan Program.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Programmers Manual, H20-0305... Operators Manual, H20-0325... Systems Manual, Y20-0071.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AFB16X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		MT 9/1600	29	01
		MT 7DC/800	26	01
		1316	52	01
OPTIONAL	none	none		none

360A-FI-06X
OPTIMUM BOND BIDDING PROGRAM

DESCRIPTION - The Optimum Bond Bidding Program, has been designed for bond underwriters to assist them in determining the coupon schedule and associated values for a bid on a new bond issue. A mathematical procedure is used which develops an optimal set of coupon rates. The optimization procedure minimizes the net interest cost or effective rate, whichever is applicable, while remaining within the constraints established by the issuer and the constraints established by the underwriter.

The program is flexible in that a number of options are provided which aid the user in obtaining bidding information for issues with various characteristics. New municipal bond issues, usually serial in nature, are normally offered for competitive bidding. The issue is, therefore, awarded to the underwriter whose bid results in the lowest cost to the municipality. Other types of bond issues, such as corporate or foreign issues, may be either offered for competitive bidding or negotiated for private placement. Regardless of the nature of the issue or the method of placement, the Optimum Bond Bidding Program will prove to be a valuable aid.

To bid for a serial bond issue, it is necessary for the user to decide upon a yield for bonds of each maturity, a spread which covers the expense and profit of the underwriter, and a range of coupon rates acceptable for each maturity. The program then constructs a set of figures which satisfies all constraints of the issue and which sets a coupon rate for each maturity so that a relatively low net interest cost or effective rate, whichever is applicable, is obtained.

The Optimum Bond Bidding Program replaces the manual methods commonly used to obtain bid figures for a serial bond issue. The program utilizes a mathematical procedure to develop an optimal set of coupon rates which minimize either the net interest cost or the effective rate depending upon the basis for the award of the issue. Many possible combinations of constraints can be quickly and accurately analyzed by the use of the Optimum Bond Bidding Program prior to submitting a bid. Basic data concerning the bond offering is transcribed from an information sheet describing the issue onto a worksheet. Then, the analyst decides upon a yield for bonds of each maturity, a spread or margin which covers the expense and profit of the underwriter, and a range of coupon rates acceptable for each maturity. After these decisions have been made, this data is indicated on the worksheet. Input cards are then punched from the data on the worksheet and entered into the computer. The program then produces the desired reports.

FEATURES -
- OPTIMIZE a bid for a serial bond issue on the basis of net interest cost.
- OPTIMIZE a bid for a serial bond issue on the basis of effective rate.
- OPTIMIZE two possible bids without premium to produce spreads in juxtaposition above and below the desired spread.
- OPTIMIZE all possible net interest cost bids without premium which produce spreads within a range of acceptable spreads.
- OPTIMIZE a bid predicated upon a desired bid price other than par. This permits a controlled premium or discount on the issue.
- OPTIMIZE a bid while using only authorized coupon multiples.
- OPTIMIZE or EVALUATE a bid, taking into consideration stated call provisions in the computation of the selling price of the bond.
- OPTIMIZE or EVALUATE an issue with bonds maturing at either six month or twelve month intervals.
- EVALUATE either a serial or term bond issue to determine spread.
- EVALUATE either a serial or term bond issue to determine bid price.
- Both the optimization and evaluation procedures adjust for an irregular first interest payment period.
- Both the optimization and evaluation procedures base the selling price on delivery date rather than on issue date.
- Control of the desired spread may be achieved in the optimization mode. A single bid may be generated to produce an exact spread, or, multiple bids may be generated to produce spreads for stated intervals within a range of acceptable spreads.
- Coupon structure limitations are checked automatically and any violation is reported in a warning message. The limitations are maximum coupon rate, maximum number of different rates, maximum number of times rate may change, and maximum range between high and low rate.
- The effective or "Canadian" rate of interest to the

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issuer is computed for each bid.
- Accrued interest per day on the entire issue is computed for each bid.
- .05 equals is computed on the basis of the actual amount production decreases when each yield is increased .05%.
- The weighted average yield and the weighted average maturity of the entire bond issue are computed.
- Control and descriptive information is printed at the top of each output page.
- A complete listing of input is printed, if desired. this listing includes a schedule of bond year values.
- Complete data is provided for each maturity on an output report.
- Abbreviated output reports may be obtained if desired.
- All essential informatien concerning the bid is summarized at the bottom of each report.
- An interest and principal payment schedule is printed, if desired. This cash-flow report will be of particular value in the calculation of bids requiring level-debt service. Annual totals may be generated on either a calendar year or fiscal year basis.

PROGRAMMING SYSTEMS - IBM Basic Operating System/360 (8K Disk) is required. Assembly - Assembler with Input/Output Macros (8K Disk) (360B-AS-309); Monitor System - Control Program (8K Disk) (360B-CL-302);Consecutive Processing Macros (360B-IO-303); ISFMS Macros (360B-IO-304); Utility Programs (8K Disk), card to Disk, Clear Disk, (360B-UT-300).

MINIMUM SYSTEM REQUIREMENTS - 32K System/360 Processing Unit with Decimal Instruction Set, printer (any of those available with 120 or more print positions), card reader/punch (any of those available), direct access storage (one 2311 Disk Storage Drive), and console typewriter for operator/program communicatien (optional).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - System Manual.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360AFI06X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 7DC/800	26	none
		DTR 9/1600	29	none

360A-IF-10X *M

PROPERTY AND LIABILITY INFORMATION SYSTEM FOR SYSTEM/360 (PALIS) (BASIC PROGRAM)

DESCRIPTION - PALIS is designed to provide data processing requirements for property and liability insurance companies in the following areas:

1. Input preparation for the daily cycle (balance, sort and edit).

2. Daily processing of both internal and external activity against a policy master file.

FUNCTIONS - PALIS Basic Program - provides billing and premium collection for direct billed business... a program statistical contribution to bureau reports... a program to build and update user tables for automobile rates... a program to edit all transactions for format and range of values... utility programs to aid the installation and modification of PALIS... programs to load, reorganize, reconstruct and restart the policy file on the 2321 Data Cell... status inquiry into policy file via local 2260 or remote 2260 and 1050... a run linkage program to interface between DOS/360 and PALIS insurance logic.

FEATURES - The system takes advantage of the powerful features of IBM System/360... the system functions in a Disk Operating System environment... the flexibility of the system design allows for user defined configurations when processing loads exceeding the capacity of the minimum configuration... both the insurance logic and run linkage provide the flexibility required to make the system adaptable to most companies...the policy master file is housed in the IBM 2321 Data Cell Drive.

USE - PALIS is designed to be the foundation of a P & L information system. As such, it creates and maintains a detailed policy enforce file. In addition, an Automobile Private Passenger policy rating and writing facility is provided. Premium loss, and historical data is maintained by policy.

The customer must provide a program to interface user data capture and data coding procedures with the system edit.

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Output programs must be written to format and in some cases further process contents of the generalized output records. records. A daily file maintenance run is contemplated. During the implementation and conversion, interface programs between PALIS output and user accounting and statistical systems must be provided.

CUSTOMER RESPONSIBILITIES - A thorough knowledge and understanding of the system before installatien... write conversion programs to create the master file... write programming to format output for printing, punching and entry into other systems... write all routines to satisfy special company policies such as underwriting criteria, loss reserving standards, accounting procedures, etc... write any programming required to effect user changes to record format; e.g., expand contract routines, additional programming to handle new fields, etc., generate and maintain tables for private passenger automobile according to the specifications provided; write programs and procedures to provide input transactions to PALIS... maintain the programs and documentation as changes to bureau requirements dictate changes in logic... provide additional logic to format replies to inquuiries beyond that supplied by PALIS.

PROGRAMMING SYSTEMS - The insurance logic program modules can be easily understood by the insurance personnel of your company as well as the programming staff since they are written in Disk Operating System/360 COBOL. The use of System/360 COBOL allows for ease of modifications to the various programs and simplifies program maintenance. Run linkage routines have been written to form an interface between the insurance logic and Disk Operating System/360. Just as the insurance logic program modules are written in a modular fashion, the run linkage is also written in a modular fashion to allow for a wider range of system configurations. The run linkage is written in Assembler Language.

PALIS uses the following components of the Disk Operating System and the user must become familiar with them-- System Control and Basic IOCS... Consecutive Tape IOCS... Direct Access Method... Group I,II, and III Utilities... Tape Sort/Merge...Assembler Language...COBOL...DOS Supervisor (6K)... RPG... QTAM

In addition, PALIS uses IBM System/360 Flow Chart (360A-SE-22X) for printing of PALIS Flowcharts.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 40G with Decimal Arithmetic (3237), Selector Channel (6980) and 1052 Attachment (7020)... 1052 Printer Keyboard Model 7... 2841 Storage Control with 2321 Attachment (8079(... 2321 Data Cell Model 1... 2311 Disk Storage Drive Model 1*... four 2400 Series Magnetic Tape Units (at least three of the magnetic tape units must be 9-track)... 2821 Control Unit with 1403 Printer Model 2 and 2540 Card Read/Punch Model 1.

The Automobile application requires 89K of core and the other Lines application requires 120K core for program, data and access method storage.

* One or two additional 2311's will be required if the user rates Homeowners in all states.

ADDITIONAL SYSTEM REQUIREMENTS FOR INQUIRY** - Storage Protection (7520). For 2260 Local: 2848 Display Control Model 2, Display Adapter (3356), Line Addressing (4787), 2260 Display Station Model 2, Alpha-Numeric Keyboard (4765). For 2260 Remote: 2848 Display Control Model 2, Display Adapter (3356), Line Addressing (4787), 2260 Display Station Model 2, Alpha Numeric Keyboard (4765), 2701 Data Adapter Unit, IBM Terminal Adapter Type III (4656). For 1050 Remote: 1051 Control Unit Model 2, First Printer Attachment (4408), IBM Line Adapter (Dependent on line-type), Keyboard Request (4770), 1052 Printer Keyboard Model 2, 2701 Data Adapter Unit, IBM Terminal Adapter Type I (4640).

For Inquiry application 26K of core is required in Foreground I for QTAM and 65K of core is required for program, data and access method storage.

** In minimum configuration, Inquiry will operate only independent of other PALIS runs.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Basic Program Description and Systems Manual (H20-0497)... Basic Operations Manual (H20-0498).
MACHINE READABLE - Source code, flowcharts and formats.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AIF10X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360A-IF-11X *M

PROPERTY AND LIABILITY INFORMATION SYSTEM (PALIS) (AUTOMOBILE)

DESCRIPTION - PALIS is designed to provide data processing requirements for property and liability insurance companies in the following areas:

1. Input preparation for the daily cycle (balance, sort and edit).

2. Daily processing of both internal and external activity against a policy master file.

FUNCTIONS - The Automobile Program - rate and write new business.. renewals... endorsements, both premium and non-premium...cancellations... (reinstatements)...claims arising... claims payments and closing... provides facility to recreate portions of the master record... provides data for premium statistical reporting.

FEATURES - The system takes advantage of the powerful features of IBM System/360... the system functions in a Disk Operating System environment...the flexibility of the system design allows for user defined configurations when processing loads exceed the capacity of the minimum configurationn... both the insurance logic and run linkage provide the flexibility required to make the system adaptable to most companies...the policy master file is housed in the IBM 2321 Data Cell Drive.

USE - PALIS is designed to be the foundation of a P & L information system. As such, it creates and maintains a detailed policy enforce file. In addition, an Automobile Private Passenger policy rating and writing facility is provided. Premium, loss, and historical data is maintained by policy.

The customer must provide a program to interface user data capture and data coding procedures with the system edit. Output programs must be written to format and in some cases further process contents of the generalized output records. During implementation and conversion, interface programs between PALIS output and user accounting and statistical systems must be provided.

CUSTOMER RESPONSIBILITIES - A thorough knowledge and understanding of the system before installation... write conversion programs to create the master file...write programming to format output for printing, punching and entry into other systems...write reserving standards, accounting procedures, etc...write any programming required to effect user changes to record format; e.g., expand contract routines, additional programming to handle new fields, etc., generate and maintain tables for private passenger automobile according to the specifications provided; write programs and procedures to provide input transactions to PALIS...maintain the programs and documentation as changes to bureau requirements dictate changes in logic...provide additional logic to format replies to inquiries beyond that supplied by PALIS.

PROGRAMMING SYSTEMS - The insurance logic program modules can be easily understood by the insurance personnel of your company as well as the programming staff since they are written in Disk Operating System/360 COBOL. The use of System/360 COBOL allows for ease of modifications to the various programs and simplifies program maintenance. Run linkage routines have been written to form an interface between the insurance logic and Disk Operating System/360. Just as the insurance logic program modules are written in a modular fashion, the run linkage is also written in a modular fashion to allow for a wider range of system configurations. The run linkage is written in Assembler Language.

PALIS uses the following components of the Disk Operating System and the user must become familiar with them -System Control and Basic IOCS...Consecutive Tape IOCS...Direct Access Method...Group I, II, III Utilities... Tape Sort/Merge...Assembler Language...COBOL...DOS Supervisor (6K)...RPG...QTAM. In addition, PALIS uses IBM System/360 Flow Chart (360A-SE-22X) for printing of PALIS Flowcharts.

MINIMUM SYSTEM REQUIREMENTS - Refer to the minimum system requirements associated with the PALIS Basic program, program number 360A-IF-10X.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...PALIS Autcmobile Premium Processing Program Description and Systems Manual (H20-0499)...PALIS Automobile Claims Processing Program Description and Systems Manual (H20-0500).
MACHINE READABLE - Source code, flowcharts and formats.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AIF11X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360A-IF-13X *M

PROPERTY AND LIABILITY INFORMATION SYSTEM FOR SYSTEM/360 (PALIS) (OTHER LINES PROGRAM)

DESCRIPTION - PALIS is designed to provide data processing requirements for property and liability insurance companies in the following areas:
1. Input preparation for the daily cycle (balance, sort and edit).

2. Daily processing of both internal and external activity against a policy master file.

FUNCTIONS - The Other Lines Program - maintain a complete insurance record for single and multi-location risks by processing the following: Endorsements, both premium and non-preimum... cancellations... claims arising... claims payments and closing... renewals... provides facility to recreate portions of the master record... provides data for statistical reporting.

FEATURES - The system takes advantage of the powerful features of IBM System/360...the system functions in a Disk Operating System environment...the flexibility of the system design allows for user defined configurations when processing loads exceed the capacity of the minimum configuration...both the insurance logic and run linkages provide the flexibility required to make the system adaptable to most companies... the policy master file is housed in the 2321 Data Cell Drive.

USE - PALIS is designed to be the foundation of a P & L is housed in the IBM 2321 Data Cell Drive.
a detailed policy enforce file. in addition, an Automobile Private Passenger policy rating and writing facility is provided. Premium, loss, and historical data is maintained by policy.

The customer must provide a program to interface user data capture and data coding procedures with the system edit. Output programs must be written to format and in some cases further process the contents of the generalized output records. A daily file maintenance run is contemplated.

During implementation and conversion, interface programs between PALIS output and user accounting and statistical systems must be provided.

CUSTOMER RESPONSIBILITIES - A thorough knowledge and understanding of the system before installation... write conversion on programs to create the master file... write programming to format output for printing, punching and entry into other systems... write all routines to satisfy special company policies such as underwriting criteria, loss reserving standards, accounting procedures, etc. ...write any programming required to effect user changes to record format; e.g., expand contract routines, additional programming to handle new fields, etc., generate and expand tables for private passenger automobile according to the specifications provided; write programs and procedures programs and documentation as changes to bureau requirements dictate changes in logic... provide addittional logic to format replies to inquiries beyond that supplied by PALIS.

PROGRAMMING SYSTEMS - The insurance logic program modules can be easily understood by the insurance personnel of your company as well as the programming staff since they are written in Disk Operating System/360 COBOL. The use of System/360 COBOL allows for ease of modificatcn to the various programs and simplifies program maintenance. Run linkage routines have been written to form an interface between the insurance logic and Disk Operating System/360. Just as the insurance logic program modules are written in a modular fashion, the run linkage is also written in a modular fashion to allow for a wider range of system configurations. The run linkage is written in Assembler Language.

PALIS uses the following components of the Disk Operating System and the user must become familiar with them - System Control and Basic IOCS...Consecutive Tape IOCS...Direct Access Method...Group I, II, and III Utilities... Tape Sort/Merge...Assembler Language...COBOL...DOS Supervisor (6K)...and RPG.

In addition, PALIS uses IBM System/360 Flow Chart (360A-(6K)... RPG... QTAM.

MINIMUM SYSTEM REQUIREMENTS - Refer to the minimum system requirements associated with the PALIS Basic program, program number 360A-IF-10X.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...PALIS Other Lines Premium Processing Program Description and

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Systems Manual (H20-0503)...PALIS Other Lines Claims Processing Program Description and Systems Manual (H20-0504).
MACHINE READABLE - Source code, flowcharts and formats.

OPTIONAL PROGRAM PACKAGE -None.

ORDERING INFORMATION: PROGRAM NUMBER 360AIF13X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-IL-09X
SYSTEM/360 ADVANCED LIFE INFORMATION SYSTEM

DESCRIPTION - ALIS represents an insurance information system's approach to the maintenance, processing, and servicing of individual life insurance contracts.

The system uses modular programming techniques to perform automatic processing of scheduled (internal) and nonscheduled (external) transactions...and updating of policies with cash values, reserves, dividends, and other forms of participation, and renewable term premium rates just before the anniversary.

Most modules which perform these insurance logic functions are programmed in COBOL. This simplifies program maintenance and modifications. Executive routines link the insurance logic modules with the IBM Disk Operating System for System/360. These routines are modular and written in Assembler Language. This separation of processing and control functions provides the widest possible range of system configuration approaches to solve individual customer requirements.

FEATURES - The system is designed in a modular concept to facilitate use and modification...insurance logic modules are designed to work in a Disk Operating System's environment...the mass direct access storage capacity of the IBM 2321 Data Cell Drive is used to house the policy master file...insurance logic is designed to provide maximum flexibility for companies of all sizes to effectively utilize its features...the system provides a base for Teleprocessing communications network...the system supports one 1050 terminal and one 2260 terminal.

USE - ALIS represents a new information system'a approach to the maintenance, processing, and servicing of life insurance contracts.

ALIS is an extremely comprehensive system, but it still must be modified or "tailored" to conform to the unique business practices of each user. Therefore, the first step in using ALIS is the determination of these modifications. The next step is to implement these modifications and to generate a policy master record file containing all of the information required by ALIS. The policy master record file and unscheduled transactions are then input and processed by the ALIS programs - scheduled transactions require no external input other than the information contained on the policy master record. Output from this processing is then analyzed by an output analysis program and routed to various programs for final printing. Intermediate files are also produced for use by the policy exhibit and valuation programs.

The Home Office Inquiry feature of ALIS may be used as soon as a policy master record file has been generated. This feature provides the facility to display on the 2260 or 1050 a partial image of the policy master record (plan, face value, mode premium issue, paid-to and billed-to dates, etc.); the name and address of the insured, payer and other; and the results of the following quotation transactions: cash surrender, conversion to nonforfeiture option, withdrawn par values on deposit, withdrawn paid-up additions, maximum loan, loan payoff, and mode premium.

CUSTOMER RESPONSIBILITIES - A thorough knowledge and understanding of the system before implementation...design conversion procedures to generate policy master records in a form acceptable to the system...generate dividend, renewable term premiums, cash value, net premiums, benefit and terminal reserve rate tables...develop adequate procedures and programs to generate policy master records for all new business, exchange, conversion, and re-instatement contracts...write programs to print premium notices and other forms of notification except where notification by automatic status is adequate...prepare Commission statements and Agents Accounting from system generated output.

PROGRAMMING SYSTEMS - ALIS operates under DOS/360 and uses the System Control and Basic IOCS, Consecutive Tape IOCS, Direct Access Method, Indexed Sequential File Management

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System, Group I, II, and III Utilities, Disk/Tape Sort/Merge or Tape Sort/Merge, Assembler language, COBOL, Compiler Input/Output Modules, and BTAM (Basic Telecommunications Access Method). Users must become familiar with these components of the Disk Operating System.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model F30 with at least 56K bytes available for program, data, and access method storage and the decimal arithmetic, storage protection, interval timer, selector channel, and 1051 attachment features...a 1051 Control Unit Model N1 with CPU attachment, systems console attachment, first punch, first reader, and first printer attachments controlling one 1052 Printer-Keyboard Model 8...2841 Storage Control with 2321 attachment feature...a 2321 Data Cell Drive Model 1 and a 2311 Disk Storage Drive Model 1...four 2401 Magnetic Tape Units Model 1...2803 Tape Control Unit Model 1...2821 Control Unit with a 1403 Printer Model 2 and one 2540 Card Read Punch Model 1.

Alternate input/output units supported by DOS/360 may be substituted to satisfy individual company requirements. Consideration must be given to volumes of input and output in light of required throughput speeds...off-line system availability...sorting capability in this or another system...requirements of programming systems for other user applications.

HOME OFFICE INQUIRY - System/360 Model F30 with 44K bytes available for program, data, and access method storage. In addition to the features required for the daily cycle and valuation programs, home office inquiry requires a 2848 Display Control Model 2 with display adapter, line addressing, non-destructive cursor, and non-destructive cursor adapter controlling a 2260 Display Station Model 2...2701 Data Adapter Unit Model 1 with Line Adapter (#4636) and Terminal Adapter (#4645)...a 1051 Control Unit Model 1 with line adapter, first printer attachment, and keyboard request features...a 1052 Printer-Keyboard Model 1.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Program Description Manual (H20-0518)...Operations Manual (H20-0517)... Home Office Inquiry Program Terminal Operations Manual (H20-0588).
MACHINE READABLE - Source programs and source ALIS maintenance program (STAMP).

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AIL09X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/1600	29	02
		MT 9/800	28	02
OPTIONAL	none	none		none

360A-ME-06X *M
IBM SYSTEM/360 BILL OF MATERIAL PROCESSOR

DESCRIPTION - The Bill of Material Processor supports the functions of creation and maintenance of the Part Number Master and Product Structure files as described below. Also included are the automatic customizing feature, the sequential processing macros and the single level product structure retrieval macro. The package provides manufacturing organizations with -

1. Easy-to-modify programs that establish and maintain basic information files describing the structure of products and their manufacturing procedures.
2. Logic diagrams explaining the retrieval of this information in fundamental applications.

The System/360 Bill of Material is a direct access file-oriented concept that requires the part number master (inventory-type) file to be on-line simultaneously with the product structure file and/or the standard routing file. All three could be used on line to produce alternate manufacturing work orders and components lists. The work center master file can be integrated by the user with the routing file for a machine loading application. All files are created, added, deleted and reorganized by the Bill of Material Processor employing Assembler Language with input/output macros. The package includes logic diagrams for eight fundamental classifications of retrieval programs that the user may desire to prepare. They are -

1. One-level bill of material or parts list.
2. Next assembly where-used listing.
3. Indented parts list.
4. Indented where-used list.
5. Summarized explosion.
6. Summarized implosion.
7. Manufacturing routings.
8. Work center where used.

The package is designed so that the logic diagrams can

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be used by any customer as a guide in the preparation of his own set of programs. The logic diagrams for classifications 5 and 6 are particularly significant since they are the framework for two major application areas that are vital to the planning and execution of the manufacturing operation. The summarized explosion logic provides the framework for performing a gross to net requirements generation application. The summarized implosion logic can be expanded to show the effect of incremental cost increases or decreases of parts and sub-assemblies on top level products.

FEATURES - This package has all the features of the IBM 1440/1311 Bill of Material Processor (1440-ME-02X) -

- Product structure records are linked with part number master inventory type records on disk files.
- Disk file chaining is used to organize product structure data in two inherent sequences.
 1. Assembly or bill of material sequence (i.e., linking the components of an assembly). The user determines the maintained sequence of components within the assembly. Typical sequences might be component part number or engineering drawing item number.
 2. Where-used sequence (i.e., linking the usages of a part number on higher level assemblies). This cross-referenced sequence eliminates the need to (a) maintain a duplicate file in where-used sequence, or (b) periodically sort an assembly deck file to where-used sequence for listing purposes.
- Raw material can be included in the product structure file, providing complete where-used cross reference of each raw material number.
- User designs his own record layouts by incorporating his own information plus certain required data into part number master inventory and product structure records.
- Low level coding is automatically maintained.
- Assembly to sub-assembly continuity is verified. This feature guarantees that the product structure records can be "exploded".
- User builds his own engineering change procedure into the file organization and maintenance programs.
- Modular in design, the system permits the user to use only those features that suit his needs.
- The ability of the user to combine program modules so that combinations of maintenance functions can be performed against multiple files during the same program run.
- Bi-directional file chains to speed the maintenance of part number where-used data. (Where record A points to record B, record B also points to record A.)
- Work Center Master File organization and maintenance containing one record per unique work center and including bi-directional work center where-used chains.
- Standard routing file organization and maintenace including -
 A. Bi-directional file chains to --
 1. Specify the logical sequence between fabrication or assembly operations.
 2. Specify the reverse sequence to aid in the calculation of scheduled start and finish times.
 3. Speed the maintenance of the file.
 B. Links to the work center master file to facilitate the accumulation of work loads.
 C. Links to and from the corresponding part number master records.
- A run activity control technique to aid in restart and reconstruction and to facilitate additional retrieval features.
- Record count for audit and control of direct access chains. The count is maintained in the part number master and Work Center Master files where the chains are anchored.
- Tailoring of the generalized source programs to the specific needs of each users installation through a special customizing program supplied with the package. The user has only to prepare a set of parameter cards to specify his needs; the choice of BOS/360 or DOS/360 is made in one of these parameter cards.
- Macros for sequential processing of both master files; this capability is available for retrieval programs Written in either Assembler Language or COBOL under DOS/360.
- Macro furnishing the capability to retrieve the set of disk file records which comprise a single level bill of material or a single-level parts where-used list; a macro also provides the capability to retrieve a Manufacturing Routing or a Work Center Where-Used List; this capability is also furnished for either COBOL under DOS/360 or Assembler Language.

PROGRAMMING SYSTEMS - The Bill of Material Processor operates under either BOS/360 or DOS/360. The BOS modules required in support are - Control Program - 360B-CL-302, Direct Access Method (DAM) - 360B-IO-305, Assembler 360B-AS-309, and Utilities, Group 1 - 360B-UT-300. The DOS modules required in support are - Assembler Basic Modules - 360N-AS-465, System Control and Basic Input/Output Control Systems - 360N-CL-453, Direct Access Method Macros - 360N-IO-454, and Disk Utilities, Group 1 - 360N-UT-461. The user may, at his own option, employ the following additional DOS/360 modules - COBOL - 360N-CB-452, Consecutive Tape I/O Control System Macros - 360N-IO-456. User data files

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created under BOS/360 may later be maintained and processed under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - For operating under BOS/360 -- 16K Processing Unit (Model D) with Decimal Arithmetic (No. 3237), 1052 Printer-Keyboard with appropriate attachment, card-read-punch (any System/360 model), printer (any System/360 model), 2841 Storage Control (Model 1), 2311 Disk Storage Drives as required to contain BOS/360 and users data files. (Minimum of two. Automatic reorganization of the Product Structure File will require one drive in addition to those required to contain the Part Number Master File and the Product Structure File.). For operating under DOS/360 -- 32K Processing Unit (Model E) with Decimal Arithmetic (No. 3237), 1052 Printer-Keyboard with appropriate attachment, card-read-punch (any System/360 model), printer (any System/360 model), 2841 Storage Control (Model 1), 2311 Disk Storage Drives as required to contain DOS/360 and users data files. (Minimum of two. Automatic reorganization of the Product Structure File will require one drive in addition to those required to contain the Part Number Master File and the Product Structure File.).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Programmers Manual, H20-0246... Operators Manual, H20-0254.
MACHINE READABLE - The macros, generalized source programs, specialized utility object programs and sample problem input.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AME06X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-ME-07X
PRODUCT STRUCTURE RETRIEVAL

DESCRIPTION - The general structure of the retrieval program consists of a mainline phase and three retrieval phases... a single level retrieval phase... an indented retrieval phase... a summarized retrieval phase. Each phase incorporating both explosion and implosion logic... a common area for constants and work area... separate formatting routines are included. Each of the three retrieval phases performs processing appropriate to it; linkage is then made to the required formatting routine to produce reports on a particular part number request.

The System/360 Product Structure Retrieval Program is a direct access file oriented concept that requires a Master Inventory File to be on line simultaneously with the Product Structure File. All files are created, added, deleted, and reorganized by the Bill of Material Processor Program (360A-ME-06X). The package includes logic diagrams and programming support for the three retrieval phases of the module. The diagrams supplying the master logic describe the decisions required to determine which records to access... accessing of the records... controls... the locations in the logic flow where the user may insert his own processing subroutines.

FEATURES - The mainline phase is the control section of this retrieval system. It performs system initialization; opening files, updating the run number... reads the first request card (type of retrieval desired)... fetches the appropriate retrieval program phase into core... passes control to it. The retrieval phases operate generally by reading the part number request card... retrieving the appropriate file records... passing control to the appropriate report formatting routine... reading the next part number request card (if any)... continuing to link to and from the report formatting routine until a new retrieval request card is encountered... returning control to the mainline. When one of the retrieval phases encounters an end of job card, control is also returned to the mainline which performs end-of-job functions and ends the run. Use of the product data can be classified as explosion (assembly data) or implosion (where used data) by using the assembly-component addresses (chains) or where-used addresses (chains) contained in the master and product structure files.

The following is a discussion of the features of each of the three retrieval phases which produce the following six report types-

- Single Level Explosion - The most fundamental type of retrieval program using product structure data in assembly component sequence. The processing output is a bill of material. The assembly is exploded into its direct components and associated quantities per assembly.

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An example of a single level explosion application that uses product structure data as a framework for processing is the extended bill of material.
- Indented Explosion - A processing technique for completely breaking a top-level or other major assembly into its multiple sub-assembly levels or tiers. The term "indented" refers to the format of the printed output frequently called an indented parts list. In addition, the order quantity of the starting assembly is multiplied by each of the quantity-per-assembly fields giving the total quantity for each component needed. This report shows a level by level relationship of all parts within an assembly.
- Summarized explosion- provides gross requirements for end products and subassemblies. This is a processing technique for completely breaking a top-level or other major assembly into all its multiple sub-assembly levels the summarizing the quantities of each part (sub-assemblies and simple parts) found in the entire product structure. Low level codes are used to eliminate re-explosion of multiple-use assemblies. This type of retrieval the framework for performing a gross to net application.
- Single Level Implosion - The most basic type of retrieval program using the product structure data in where-used sequence. The output of the processing is a next assembly where-used listing.
- Indented Implosion - A processing technique for tracing the usages of a given part number in assemblies at various usage levels, and in turn, the use of the part number in higher level assemblies up to the top assembly level. The term "indented" refers to the format of the printed output which shows a level by level relationship through all products.
- Summarized Implosion - A multi-level processing technique that totals the direct and indirect usages of a part number on all higher level assemblies. The printed output indicates all the assemblies that directly or indirectly contain the part number, including the total quantity of the part number in each assembly. This type of retrieval also reflects the effect of incremental cost increases or decreases of simple parts or sub-assemblies on top level products.

PROGRAMMING SYSTEMS - Assembler Language with input/output macros under supervision of the Basic Operating System/360 or Disk Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - A 2030 D or E Central Processing Unit (16K under BCS control or 32K under DOS control) with Decimal Arithmetic (No. 3237), 1051 Attachment (No. 7915)... 1051 Control Unit Model N1 for console printer-keyboard, First Printer Attachment (No. 4409), CPU Attachment (No. 3130), First Punch Attachment (No. 4410), First Reader Attachment (No. 4411)... 1052 Console Printer-Keyboard (Model 8)... (any S/360 model) card read punch... (any S/360 model) printer... 2841 Storage Control Model 1... 2311 Disk Storage Drives, Model 1, as required to contain Basic or Disk Operating System/360 and users data files (minimum of 2).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory, Programmers Manual, H20-0369... Operators Manual, H20-0370.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AME07X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360A-MF-04X *M
SYSTEM/360 INVENTORY CONTROL

DESCRIPTION - This group of integrated programs has been especially designed for the implementation of order point inventory control where it applies in manufacturing organizations.

Programs are provided for (1) classification of inventory items for determining the type of control, (2) calculation of economic order quantities based upon usage information or future requirements, (3) computation of safety stock and order point, (4) projection of demand based upon historic data, and (5) basic programs for transaction processing and report preparation.

This application programming package consists of source programs and supporting documentation for the installation of an effective order point inventory control system. There are three major aspects - planning, projection, and execution.

For PLANNING purposes three programs are provided: (1) Inventory Analysis, (2) Order Point, and (1) 3) Order

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quantity.

The PROJECTION phase includes four programs (1) Edit, (2) Model Select, (3) Initial Update, and (4) Update and Project.

The EXECUTION phase is made up of two basic programs: (1) Transaction Processing, and (2) Status Reporting.

Inventory Analysis - A program that provides detailed analysis of inventory items based upon usage and cost. The output is useful in determining how the items are to be controlled.

Order Point - A program that calculates order point and safety stock for items in the inventory master file. Seven different options for computing safety stock are provided. Four of these use Mean Absolute Deviation (MAD) and user supplied level of service.

Order Quantity - Inventory carrying rate and order costs are used by this program to determine economic order quantities. The program calculates order quantities based on average usage or future requirements. Four techniques for order quantity calculation are included in the module. It is highlighted by an analysis for implementation feature which permits the user to analyze the effect of changing order quantities prior to implementing.

Edit - A program that provides an interface to user demand data. The program converts the user's demand history file (card, disk or tape) to format required for the model select program. It also edits data for unusual demand variations.

Model Select - The historic demand information is analyzed by this program to determine if patterns exist. Items are classified into one of four types that are used to select the technique for projecting future demand. Initial values (averages, MAD, etc.) are also computed.

Initial Update - This program uses the output of model select and places these codes and values on the item master file.

Update and Project - An operational program that uses the latest demand for each time period and keeps the items master up to date. It has provision for projecting future demand based upon the most recent information in the item master file.

Transaction Processing - This program accepts input transaction, for example, receipts, issues, etc., and updates the item master record. Transaction listings with exception highlighting and order recommendation cards for order point items are the output of this program.

Status Reporting - Information regarding the status of items in the file is made available by this program. Output is a stock status report for all or a selected portion of the items in the file.

FEATURES -
- Nine programs are provided to assist the customer in developing an order point inventory control system.
- Four of the inventory programs are for analysis of inventory usage to provide information for operational programs.
- Operational programs that update inventory master record for current status and the most recent usage information.
- Provision for order action notice for order point items when order point is calculated and when transactions are processed.
- Five options for computing safety stock including two statistical methods using Mean Absolute Deviation (MAD) and user specified level of service.
- First and second order exponential smoothing with automatic updating of MAD.
- Highlighting of items when new order point varies from old order point by a specified percentage.
- Evaluation of old and new safety stock each time order point is calculated.
- Analysis can be performed on all items or on a portion of the file, with or without updating.
- Order quantity calculations based on averages of future requirements.
- Four methods for calculation of order quantity with exits for insertion of user routines.
- Analysis for implementation is part of the order quantity program; it provides for contrasting the newly computed order quantity to existing order quantity.
- Analysis for implementation feature of order quantity program provides for contrasting the newly computer order quantity to existing order quantity with respect to inventory level and set up costs.
- Order quantity category code allows for many combinations of order costs and carrying rates. Only the code is stored on the inventory record.
- Provision for processing specific transactions

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that update the master inventory file.
- Special emphasis is placed on ease of implementation.
- Programs are modular in design to permit the customer to use only the options he desires.

The programs are designed to utilize files organized by the S/360 Bill of Material Processor (360A-ME-06X) or the DOS/360 Indexed Sequential File Management System (360N-10-457). The two basic programs for execution phase can be easily modified by the user to produce additional reports and process other transactions. Normally this will only involve changing the RPG specifications for input, output, and processing.

USE - The System/360 Inventory Control Programs are direct access file oriented and work in conjunction with an item master inventory file. The records within this file are created, added, deleted, and reorganized using the S/360 Bill of Material Processor Program or DOS/360 Indexed Sequential File Management System.

The inventory control package includes initializing and operational programs. Inventory Analysis, Edit, Model Select, and Initial Update are designed to be used once to set up the system, then periodically (perhaps yearly) or as required to meet changing conditions. Order Point and Update and Project are run on a regular basis (for example, every month or every two weeks). The frequency of using the Order Quantity program depends upon the user's requirements. Normally the items considered as having a fixed order quantity would be processed once or twice a year. This is true if present order quantities are consistent with management's ordering policy. If the order quantities are not considered economical, this program, with its analysis for implementation feature, will be used frequently.
The execution phase consists of two basic programs for recording and obtaining information from the file. The two basic programs of execution (or modifications to these of the user's own programs) will be used in the day-to-day operation. The amount of use depends upon transaction volume and the number of reports the user prepares.

CUSTOMER RESPONSIBILITIES -
- Tailor the source programs to meet user requirements.
- Organization and construction of item master file, including specifying all data fields to be included.
- Creating, adding, deleting of records in the master file.
- An understanding of the inventory control concepts embodied in the programs so that the customer can make the selection and/or specification of parameters for planning and projection programs.
- Provide historic data for inventory analysis programs.
- Identification coding and processing definition for transactions.
- Writing routines to perform tasks not covered by these programs.

PROGRAMMING SYSTEMS - Inventory Control Programs will operate under the IBM System/360 Disk Operating System. The planning and projection programs are written in Assembler Language. The execution programs are written using Report Program Generator.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 2030E... Decimal Arithmetic (#3237)... 1051 Control Unit Model N1... 1052 Printer-Keyboard Model 8 with appropriate attachments... System/360 card reader and card punch or card read punch capable of reading one file and punching a second file simultaneously... System/360 printer with 120 print positions... 2841 Storage Control Model 1... 2311 Disk Storage Drives as required to contain Disk Operating System/360 and user's data files.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0555)... Operations Manual (H20-0556).
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AMF04X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-MF-05X *N
SYSTEM/360 REQUIREMENTS PLANNING PROGRAM

DESCRIPTION - Offers a mechanized approach to detailed requirements planning for a large segment of manufacturing industries. This system used the Item Master and Product Structure files created by the System/360 Bill of Material Processor Program (360A-ME-06X). It performs time series planning to determine planned orders for finished products, assemblies, sub-assemblies, parts, and raw material based upon the input of forecasts and orders.

This system determines the net requirements for finished products and components parts, establishes planned orders based on the predetermined order policy, and offsets the planned orders with respect to lead times. Additional capabilities include projecting demand... consideration of safety stock, allocated quantity, shrinkage factors... plan order policies include discrete, fixed quantity, least unit cost, and part period balancing... modifying plan order policies by considering number-days-supply, minimum-maximum-multiple quantities, and cutoff dates... offsetting by a fixed or a calculated lead time. Processing variations include: complete generation of requirements, Requirements Alteration (revisions to gross requirements), and Conversational Planning (revisions to planned orders).
A customizing procedure permits a user to tailor the system to meet his specific requirements. System/360 Requirements Planning utilizes many of the concepts of the requirements planning subsystem discussed in the IBM Production Information and Control System (E20-0280).

System/360 Requirements Planning consists of two programs: The Requirements Generation Program and the Print Exception Program. The inputs to the system are from card, magnetic tape, or disk and contain the gross requirements by shop day, calendar date or time period. Card input is by date and quantity only. These requirements can be generated manually from a forecast, from customer orders, or from System/360 Inventory Control (Application Description Manual H20-0471). This input spans a user specified number of planning time periods into the future. The output of the Requirements Generation Program is in the form of planned orders for purchased and manufactured items. Orders for items manufactured are available for input to a capacity planning function, and orders to be purchased are available to a purchasing function. A considerable amount of flexibility is provided by System/360 Requirements Planning relative to the printing of pertinent information. This flexibility is provided to enable the extraction of as much or as little information as desired. Three types of reports are provided: detailed requirements, planned orders that have been adjusted through Conversational Planning, and an exception report. The Print Exception Program is used to print the exceptions generated from the Requirements Generation Program.

FEATURES -
- Two programs are provided to assist the user in performing requirements planning: The Requirements Generation Program performs the actual time series requirements generation, and the Print Exception Program prints notices for the exceptions that were discovered during requirements generation.
- Functions performed include gross requirements determination, net requirements determination, plan orders, and offset requirements. Net requirements determination, plan orders, and offset requirements are optional functions.
- Many options are provided within the functions. These include: projection of demand... safety stock quantity.. allocated quantity... shrinkage factor... discrete, fixed quantity, least unit cost, part period balancing, and user order policies... minimum-maximum-multiple, number-days-of-supply, maximum quantity, and cutoff date modifiers to order policies... fixed and calculated lead time... product structure offset adjustment... product structure scrap factor... user's exits for engineering change effectivity of product structure.
- Three types of processing variations are provided. These include: complete generation of requirements, Requirements, Requirements Alteration (revisions to gross requirements), and Conversational Planning (revisions to planned orders).
- Three types of reports are provided. These include: detail report of requirements, planned orders that have been adjusted through Conversational Planning, and an exception report.
- Two optional methods are provided for printing of detail requirements. These include printing of item indicative information, gross requirements, open orders, net requirements, planned orders, and offset requirements in random sequence, as requirements are generated, or at the completion of generating requirements in the sequence that the Item Master file is organized.
- Provision is made to store gross requirements, open orders, and planned orders in either an Item Master file or a Subordinate Item Master file, both of which are created and maintained by the System/360 Bill of Material Processor. When the Subordinate Item Master file is used, any combination of the gross requirements, open orders, and planned orders will be stored as one separate record for each item. The linkage between the two files

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will be created by System/360 Requirements Planning.
- Input to the system is from card, magnetic tape, or disk and contain gross requirements by shop day, calendar date, or time period. Card input is by date and quantity only.
- A customizing procedure permitting the user to select the functions and options necessary to tailor the system to meet his specific requirements.

USE - System/360 Requirements Planning is direct access file oriented utilizing data contained in the Item Master, Product Structure, and Subordinate Item Master (optional) files. The records within these files are created and maintained by the System/360 Bill of Material Processor Program (360A-ME-06X).

Frequency of use of System/360 Requirements Planning will depend on the user needs of his production planning function. Typically, each scheduled program run would be a complete generation of requirements with the input of gross requirements spanning from the current time period to the last time period in the planning horizon. The Conversational Planning (optional) method of processing enables the system to stop processing after each level of planned orders have been developed. This allows the planned orders to be reviewed and, if necessary, readjusted before the next level of requirements is determined. Thus, either complete requirements generation or Conversational Planning would normally be performed on a scheduled basis. Requirements Alteration processing (optional) provides for regeneration of requirements due to changes to the original gross requirements input. In this instance, only the altered gross requirements are input to the system. Requirements Alteration processing would normally be performed between scheduled complete requirements generation or Conversational Planning program runs.

CUSTOMER RESPONSIBILITIES - A thorough knowledge and understanding of this program before installation... customize System/360 Requirements Planning to meet user requirements... a thorough knowledge and understanding of the IBM System/360 Bill of Material Processor... provide and maintain a shop calendar that resides on a direct access device... define contents and format of the Item Master, Product Structure and Subordinate Item Master files... maintain accurate up-to-date data... provide open orders to the system... provide file organization and maintenance of the Item Master, Subordinate Item Master, and Product Structure files through the use of the IBM System/360 Bill of Material Processor Program (360A-ME-06X).

PROGRAMMING SYSTEMS - System/360 Requirements Planning programs are written in Assembler Language utilizing the macro language facility and will operate under the IBM System/360 Disk Operating System. The DOS/360 Disk Sort/Merge (360N-SM-450) is required if the exception notice file is to be sorted. In addition, the System/360 Bill of Material Processor (360A-ME-06X) is also required.

MINIMUM SYSTEM REQUIREMENTS -

Device or Feature	For S/360 Model 25	For S/360 Model 30
System/360 Central Processing Unit, 32K bytes	2025E	2030E
Decimal Arithmetic Special Feature	standard	3237
Control Unit for Printer-Keyboard	--------	1051 N1
System/360 Card Reader (see Note 1)	2540	Any
Printer-Keyboard	1052 Model 7	1052 Model 8
System/360 printer	1403 Model 2	Any (with at least 132 print positions)
Storage Control	--------	2841 Model 1
Disk Storage Drives (as required to contain DOS/360 and the user's data files (minimum of 2)	2311 Model 1	2311 Model 1
Direct Access Storage Facility (see Note 2)	--------	2314 Model 1

NOTES:
1. A System/360 card punch, while not used by the System/360 Requirements Planning programs, is required for system preparation.

2. In addition, a 2314-only system configuration also requires a 2400 series tape drive for system preparation.

Refer to the machines section of the sales manual for appropriate attachments required for connection of input/output units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Manual (H20-0584)... Operations Manual (H20-0583).
MACHINE READABLE - Source code programs and sample problem.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AMF05X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	1316		52	01
		MT	7DC/800	26	01
		DTR	9/800	28	none
		DTR	9/1600	29	none
OPTIONAL	none	none			none

360A-SC-01X *M

COMMUNICATIONS CONTROL APPLICATION PROGRAM (CCAP)

DESCRIPTION - The Communications Control Application Program (CCAP) is a basic programming package for implementing a computer controlled, store and forward communications network. Not only can your customers use this package to install a modern communications system, but with the IOCS option user programs can now process various applications concurrent with message switching.

Some examples are - Sales Order Entre... Data Collection... Order Processing... SPOOL.

This program is a complete package which performs the basic functions of a communications store and forward message switching center including -

- Terminal polling, receive and transmission of all traffic.
- Automatic logging and routing of traffic.
- Message security and sequence number checking under computer control. Date time stamp and sequence numbering of output messages.
- Line and network status reporting.
- Message retrieval procedures.
- Queueing of traffic for inoperative or closed terminals and automatic transmission upon recognition of terminal-up condition.
- Line and terminal error detection and reporting.

Provision is made for accommodation of specific user terminal mnemonics (1-4 characters) and terminal polling characters. Header analysis is provided as a series of modular subroutines which can be utilized as required by the specific users header format. The maximum number of terminals that can be controlled is 255.

In addition to these features, the program includes physical IOCS routines for 2400 Series Magnetic Tape Drives, 2540 Card Read Punch, 1403 Printer, and 2311 Disk Storage device. When adequate core memory is available, a user may utilize these routines to add his own processing programs, written in S/360 Basic Assembler, to be run in conjunction with the message switching application. I/O is scheduled by the CCAP Monitor Supervisor, which gives first priority to the message switching functions, and then on a FIFO basis within an individual queue per device. Devices are handled independently, allowing overlap of operations. The program is designed to operate in a System/360 Model 30 processor with 16K or 32K positions of core storage. Before attempting to install the system on a larger model System/360, consult the Systems Manual for information relating to required modifications in addressing. Additional modifications are necessary in the diagnostic routines for use on the System/360 Model 40.

FEATURES -

- Extensive supervisor controls to display terminal status, line queues, alter terminal and line status, set polling limits, start and stop system.
- Automatic checkpoint and restart facility.
- facility for automatic broadcast and distribution messages.

CCAP includes all of the error routines required to control a communications network and is, therefore, a complete package. the program is also modular so that additions of non-supported terminals or a non-supported header format may be included with minimum effort.

The user must adapt the program tables to meet the specific requirements of his network. The basic functions of receive and send, log and queue, identify and route, code convert, analyze and control are provided by the program package. Information concerning terminal mnemonics, polling characters and header format must be included in the program by the user. Messages are prepared on paper tape at the various terminal locations and entered into the terminal. After being polled by the computer, the message will enter the system, be received and logged on disk file storage. The message header will be analyzed, routing performed, tables updated, output headers constructed and queued for transmission. When the output line is available, the message will be transmitted. Information concerning line

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queues and terminal status is printed cut upon demand, utilizing supervisor controls.

PROGRAMMING SYSTEMS - The source language is the System/360 Basic Assembler.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Model D Processor with Decimal Arithmetic, Interval Timer, 1050 Attachment and one selector channel... A 1051 Control Unit Model N1 with CPU Attachment Feature, First Printer Attachment Feature and a 1052 Printer-Keyboard Model 6... A 2841 Storage Control Unit and at least one 2311 Disk Storage Drive (maximum 8)... A 2702 Transmission Control Unit with Telegraph Terminal Control - Type I feature, telegraph line adapters, Line Expansion feature if more than 15 lines are required as well as appropriate features for attachment of 45, 57, or 75 bps communication lines. It must be realized that in order to assemble CCAP, a system configuration is required that contains card and tape equipment.

When the minimum configuration is used, 6,100 bytes have been allocated for line tables and buffers and terminal tables. The program requires 194 bytes per line appearance and 19 bytes per terminal, thus a typical configuration of 20 lines and 100 terminals may be accommodated within the 16K system. Variations of the line and terminal configurations may be accommodated within the 6,100 byte core limitation. Expansion of core storage and appropriate file and line termination capabilities will permit servicing of networks including more than 20 lines and up to the maximum of 255 terminal locations. The maximum number of lines that can be accommodated in a 32K or 64K system will require analysis of process timings and channel utilization. The addition of the IOCS routines makes larger system configurations very attractive. It will be necessary to make individual studies of configurations with greater numbers of lines, or throughput and channel utilization considerations which may require larger buffer areas. Typical core storage allocations -

16K Model 30

10,300	Message Switching (includes 2311 IOCS)
3,880	20 lines
1,900	100 terminals
16,080	Total Bytes

32K Model 30

10,300	Message Switching
1,400	IOCS for 2400, 2540, and 1403
7,760	40 lines
3,800	200 terminals
9,440	User-written Programs
32,700	Total Bytes

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Application Description, H20-0165... Programmers Manual, H20-0244... Operators Manual, H20-0245 Manual.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Systems Manual.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ASC01X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-SE-15X
IBM S/360 DATA CONVERSION - UTILITY I PROGRAM

DESCRIPTION - The IBM System/360 Data Conversion Utility I provides an effective and flexible capability for customers to convert their current IBM system data files to System/360 data sets. Designed as a general purpose utility program utilizing control cards, this program accepts as input, data sets in the format of the IBM 1620, 1401, 1440 1460, 1410, and 7010 systems, and produces as output the data format desired for System/360. The program accepts card, tape or DASD data sets from the above current IBM system (where IBM written DUMP or UNLOAD routines have been used when coming from a current IBM system DASD) and writes these data sets on System/360 tape or DASD units. The program has data transformation capability that allows the user maximum flexibility in "resystematizing" has data sets for System/360.

This program accommodates the three general considerations

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in data conversions -

- The physical characteristics of the I/O device (i.e., 7-track tape format).
- Current IBM programming systems standards (i.e., labels, padding, characters, checkpoint records, etc.).
- Optimization of data representation (i.e., floating point, binary, packed decimal, etc.).

The Data Conversion Utility I Program is designed to run under control of the IBM Basic Operating System/360 (8K Disk) and will utilize the Basic Operating System input and output capability. The program is divided into two steps -

- Analyzing the control cards.
- Performing the requested data conversion.

To describe any of the allowable data conversion options, control cards are used to specify information in four areas:

- The input data...
- The desired Move/Transformations...
- The output data...
- The user exits and user tasks to be performed.

The analysis of the control cards extracts the data from control cards so it is available to the modules at execution time and provides for user exits and tasks that are specified. This step also analyzes the Move/Transform information from the control cards to provide the necessary information to relate the input and output fields.

The second step is divided into a maximum of four functions with overlays, as required, to perform the data conversion specified in the control cards. The functions and their overlays are -

- Current IBM system input - 14XX label checking; 14XX/7010 checkpoint elimination; BCD fixed length tape records (with or without padding); BCD variable length tape records (14XX); 1620/14XX DASD cards; Code conversion of dual special characters; Card data files.
- Move/Transform Strings - The move/transform strings can be used for multiple record types or combining multiple records from the input data set into one output data record.
- System/360 output - System/360 labels (volume and file); fixed length tape records (7- or 9-track); variable length tape records (7- 9-track); DASD - indexed (sequential, sequential, and direct access).
- User modules - User routines as required (e.g., non-standard tape labels).

The Data Conversion Utility I Program is designed for ease and flexibility of use. The program resides on the relocatable library and runs under control of the IBM Basic Operating System/360 (8K Disk). The program can be used for the permanent conversion of current IBM system data sets into System/360 sets and can also be used to obtain "live" test data from current IBM systems for use in testing System/360 application programs. Since input data may be on either 7- or 9-track tape, customers whose initial conversion to System/360 is planned around emulation will be able to use the Data Conversion Utility I program to convert their even parity, and BCD 9-track Emulator data sets when they convert their programs to System/360.

The program is designed to allow ease of customer modifications. User exits are provided for non-standard current system labels on input, non-standard System/360 labels on output, and before each function within the program to allow the user to perform the function or change the method of performing the function (i.e., the user could bypass the normal input GET (locate) on the current IBM system data set). When user tasks are indicated, the user task(s) and the data conversion program will reside in storage together.

FEATURES -

- The IBM System/360 users are provided a facility to reduce substantially the difficulties, time and costs of performing the required data conversions.
- Allows greater flexibility for scheduling user manpower in new application areas where potential savings may be made. More of the manpower can be concentrated on the solution to the application problem, rather than the nature of the data.
- Encourages the user to write his IBM System/360 application programs using record organization and data formats which will allow him to give the full advantages of the IBM System/360.
- Encompasses the requirements of current IBM system users, regardless of the machine size and configuration.
- Provides comparable data conversion facilities to users, regardless of the IBM System/360 language used.
- Designed for ease of user implementation, modification, and maintenance.
- Allows the user to readily change his data storage media.
- Allows the user of the IBM System/360 to take advantage of the flexibility provided by DASD capacities and

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capabilities.
- Designed to allow the user to tailor the program to his individual requirements through user exits and modular program organization.

PROGRAMMING SYSTEMS - The Data Conversion Utility I is programmed using the IBM Basic Operating System/360 Assembler with Input/Output macros (8K Disk) as described in C24-3361.

MINIMUM SYSTEM REQUIREMENTS - An IBM System/360 Model C30 (8K or above with Decimal Arithmetic (No. 3237). The Basic Operating System/360 (8K Disk) requirements of devices for system residence and system input are necessary. In addition, input/output devices, as required, are needed for the following -

- One or two 2400 Series Tape Drives for the input data set.
- 2540/2501 for 1620/14XX DASD or other data card input.
- One or two 2400 Series Tape Drives for the output data set.
- One or more IBM 2311's for the DASD output data set.

Note - 2400 Series Tape Drives can be 9-track unless they interface with 729 Tape Drives in which case the 7-track head and 7-track feature are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Application Description H20-0194... Programmers Manual H20-0232... Operators Manual H20-0233.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Systems Manual.
MACHINE READABLE - Source programs and sample problems.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE15X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360A-SE-19X *M
1400 AUTOCODER TO COBOL CONVERSION AID PROGRAM

DESCRIPTION - ACCAP is a System/360 Application Program which accepts as input, source statements written in Autocoder or SPS for the 1401, 1410, 1440, 1460 and 7010 systems. It produces System/360 COBOL statements when possible and diagnostic messages in the case where the program is unable to complete the translation. ACCAP performs the conversion on a statement-for-statement basis. Therefore, the generated code may not be as optimum as COBOL coding written expressly for System/360. Where the program is unable to translate the Autocoder (SPS) source statement, it will provide a diagnostic message. Thus a manual coding effort is required to complete the new COBOL source program prior to its compilation and testing.

FEATURES - Machine assisted conversion of Autocoder (SPS) program to a problem oriented language... generates COBOL statements using the same symbolic labels of the Autocoder program, supplemented with information indicating their original use... all Autocoder comments are included on the COBOL listing and comment cards become COBOL notes in the new source deck... the output listing allows a programmer to relate the original Autocoder statements to the generated COBOL statements... diagnostics, provided on the output listing, highlight the specific statements which require user attention... retention of the original program logic allows the user to relate this logic to the new COBOL program... no user modifications to the Autocoder source programs are required... testing of the new COBOL program is facilitated by the use of the generated cross-reference listing... produces properly structured cobol divisions in sequence and creates a syntactically correct COBOL source deck. ACCAP contains its own control program which was adapted from OS/360. This control program is independent of the users System/360 Operating System and allows Autocoder or SPS programs or both to be stacked for input.

MINIMUM SYSTEM REQUIREMENTS - A System/360 Model G40 (131K) with Decimal Arithmetic... 1052 Printer-Keyboard Model 7... 2540 Card Read Punch Model 1... 1403 Printer... two 2311 Disk Storage Drives.

The minimum configuration accepts Autocoder or SPS source decks of up to approximately 6,000 cards. Source decks up to 10,000 cards can be handled by adding to the minimum configuration one 2311 Disk Storage Drive or two 2400 Tape

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Drives. The same EC levels required for OS/360 are required for execution of ACCAP.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Programmers Manual (Y20-0105)... Operators Manual (Y20-0106).
MACHINE READABLE - The dump/restore image of ACCAP system pack.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE19X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01
		1316	52	01
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360A-SE-20X *M
SYSTEM/360 DATA CONVERSION UTILITY II (SEQUENTIAL)

DESCRIPTION - Data Conversion Utility II provides an effective and flexible capability for users to convert their current IBM system data files to System/360 data sets. The program is designed to run under the control of the IBM Operating System/360. Designed as a general-purpose program, it will accept, as input, data sets in the format for use with the IBM 705/1410/7010 and 7000 series systems. System/360 data sets are also accepted as input as indicated below. The program produces as output the data format desired for System/360 tape or DASD. The program has data transformation capability that allows the user flexibility in "resystematizing" his data sets for System/360.

The Data Conversion Utility II program accommodates the three general considerations in data conversions -

1. The physical characteristics of the I/O device (i.e., 7-track tape format).
2. Current IBM Programming Systems Standards (i.e., labels, padding characters, checkpoint records, etc.).
3. Optimization of data representation (i.e., floating point, binary, packed decimal, etc.).

Data Conversion Utility II is a set of special-purpose macros, subroutines, and modules. These may be combined in a large variety of ways to create a specific data conversion program that meets the exact requirements of the users data set to be converted from current IBM system formats to System/360 formats. There are two steps involved in using the Data Conversion Utility II -

1. Creating a specific Data Conversion Utility II Program.
2. Executing this specific Data Conversion Utility II Program.

To perform the first step, the user creates a Data Conversion Utility II Controller by combining in Assembly Language -three controller macros... data move/transform macros as required to perform field transformations... test macros as required for record selection, etc... a common table macro that provides specific information about the input and output files that cannot be furnished via the DD card, such as 7070/7074 form 3 records 35 words or less in size, etc.... user code as required. The controller is combined with an input module and an output module by use of the linkage editor to create the unique Data Conversion Utility II program. The second step is performed by executing the utility program created in step one. This is done by providing the IBM Operating System/360 with the necessary job control cards and the data set to be converted. During program execution, Operating System/360 can make use of a set of modules provided with this program to simplify processing of current IBM system standard labels on input tapes, which are considered non-standard by System/360. In addition, linkage is provided to user-written header and trailer label modules if processing of current IBM system non-standard labels is required. These label checking modules also provide linkage for user-written label checking modules.

Input Module - For a particular data conversion run, the input module that is best suited to process the input data file is selected from -

- Card Data File Input - These modules read data cards on an 80/80 basis. They are intended to assist in converting card data files, such as tub files, to System/360 tape or DASD data sets. There are two card input modules; one is provided to process Hollerith/EBCDIC cards, and the other handles column binary card

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input.
- 705/1410/7010/7080 BCD Variable-Length Tape Record Input- Three types of modules are provided to GET even-parity BCD variable-length records written on 7 or 9-track tape. The first type locates blocked or unblocked logical records whose length is established by terminal records marks. The second locates blocked or unblocked logical records of the size specified by a BCD length counter within the logical record. The third will locate an unblocked logical record where the record requires neither a terminal record mark nor a BCD length counter. All module types will bypass applicable checkpoint records.
- BCD Fixed-Length Tape Record Input - This Module will GET even-parity BCD fixed-length records written on 7- or 9-track tape. Interspersed checkpoint records or segment mark records will be deleted. The input tape may be zero-suppressed or non-zero-suppressed.
- Mixed Mode Tape Record Input - This module will GET all binary or intermixed even-parity BCD records and odd-parity binary records. Records may be either variable-length unblocked or fixed-length blocked or unblocked.
- Sequential System/360 Tape/DASD Record Input - This module will GET records from any System/360 sequential data set. Records may be either fixed or variable, blocked or unblocked.

Output Modules -

- System/360 Sequential Tape/DASD Output - Fixed or variable-length, blocked or unblocked logical records can be created on System/360 tape or DASD with this module. The data records may then be processed sequentially by the application program.
- System/360 Direct Access DASD Output - Fixed or variable-length unblocked records can be created on System/360 DASD with this module. The BDAM method is used to write the records, therefore, if blocking of records is to be done, the user has to set up the blocked physical record before calling the direct access output module.
- System/360 Indexed Sequential DASD Output - fixed-length, blocked or unblocked logical records can be created on System/360 DASD with this module. The records can then be retrieved sequentially or directly.

FEATURES -

- Provides the IBM System/360 users with a facility to reduce substantially the difficulties, time, and costs of performing the required data conversions.
- Allows greater flexibility for scheduling user manpower in new application areas where potential savings may be made. More of the manpower can be concentrated on the solution to the application problem, rather than the nature of the data.
- Encourages the user to write his IBM System/360 application programs using record organization and data formats which are optimum for the IBM System/360.
- Encompasses the requirements of current IBM system users, regardless of the machine size and configuration.
- Provides comparable data conversion facilities to users, regardless of the IBM System/360 language used.
- Is designed to allow the user to tailor the program to his individual requirements through modular program organization and the data move/transform and test macros.

Data Conversion Utility II, (sequential, direct access) runs under control of Operating System/360. The program can be used for the permanent conversion of current IBM system data sets into System/360 sets and can also be used to obtain "live" test data from current IBM systems for use in testing System/360 application programs. Since input data may be on 7- or 9- track tape, users whose initial conversion to System/360 is planned around emulation will be able to use the Data Conversion Utility II Program to convert their even-parity BCD 9-track emulator data sets when they convert their programs to System/360. The object decks and the macro definitions which make up part of the Data Conversion Utility II package must be cataloged in a link library and the macro library respectively. Users of the sequential version must delete the old Data Conversion Utility II macros before cataloging the new macros. The NSL modules must be cataloged in the SYS1 SVCLIB library. the user then writes the necessary Data Conversion Utility II macro statements (and user routines if required) to specify the desired data conversion program. The user also has to specify in the linkage editor run which input and output modules to include.

PROGRAMMING SYSTEMS - The program is written in the IBM Operating System/360 Assembler Language as described in C28-6514. It is designed to run under control of the IBM Operating System/360, and uses the Operating System/360 input/output capability.

MINIMUM SYSTEM REQUIREMENTS - A System/360 Model 30 or above with Decimal Arithmetic. Storage requirements are dependent on the size of the IBM Operating System/360 supervisor used, the Data Conversion Utility modules selected, the maximum input physical record size, the maximum output physical record size, the maximum work area size (required for 7070 input module), the area used for the requested move/transformations (instructions, conversion

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subroutines, subroutine linkages, constants and literals), and user routines. The OS/360 requirements for system operation and program assembly must be utilized to create a specific data conversion utility program. For executing the created utility, the devices for operating System/360 System operation are required; in addition, the following input/output devices may be used -

- One 2400 Series Tape Drive for the input data set.
- 2540/2501 for data card input.
- DASD for input of S/360 sequential data set.
- One 2400 series tape drive for the output data set.
- One DASD for the output data set.

Note - The 2400 series Tape Drives can be 9-track, unless they interface with 729 Tape Drives, in which case the 7-track Read/Write Head feature and a 7-track Compatibility feature are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Programmers Manual, H20-0313... Operators Manual, H20-0314... Application Directory.
MACHINE READABLE - Object code, macro definition cards, source cards and sample problems.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Assembly Listings.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE20X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360A-SE-22X *M
SYSTEM/360 FLOWCHART

DESCRIPTION - System/360 FLOWCHART is a program for generating printed program flowcharts from statements written in a specially designed input language. Only a general understanding of flowcharting is needed by the user of this program. It can be used readily by non-programmers as well as programmers. The input language is easy to learn, simple to use, and will describe flowcharts for any system. Benefits from using this program include -

- Providing an easy-to-use method of producing flowcharts.
- Reducing total program effort by minimizing the time required for producing and maintaining necessary program documentation.
- Facilitating program maintenance in a dynamic environment by providing a cross-reference listing which gives all references to a block shape.
- Providing wide flexibility for drawing flowcharts to specific user requirements.
- Providing flowchart uniformity.

Although the input language has been simplified considerably and is entirely different, the output format is similar to the 7070/74 Autochart program. The program uses data processing methods to facilitate the production of program flowcharts and certain other graphic information. The user prepares the original input in System/360 FLOWCHART language. This language is very simple and is machine independent. It can be used to prepare flowcharts for any system. The computer processes this input to produce a file of charts on the 1403 Printer. If a flowchart is to be produced, it will describe the type of blocks, symbolically direct non-sequential flow, and supply any other information desired, such as labels, exit conditions, text within blocks, etc. The language can also be used to describe lines other than flowlines and any other textual information. The flowchart pages, each of which can have up to 50 blocks, are planned automatically by System/360 FLOWCHART. Flowlines are drawn where possible, and where they cannot be drawn, connectors are generated. all block shapes used in System/360 FLOWCHART are combinations of printer characters to approximate conventional flowchart symbols. An option is provided so that either the Autochart Symbols or the Flowchart Symbols for information processing may be specified. There are six basic operator types for input; one is required for every statement. They are:

1. Headings, used to generate new headings and page numbers.
2. Block-shape operators to designate the type of block desired.
3. Branching or flowline control, to designate conditions and symbolic line destinations when the flow is non-sequential.
4. Spacing, used to skip blocks or columns or eject a page.
5. Comment and draw operators to add comments and lines.
6. End of job operator, which is required.

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System/360 FLOWCHART is a multi-phase program; the output of each phase becomes input to a later phase. The input can be cards or tape in card-image format. The final output will be printed charts or charts on tape. In addition to the machine-generated flowcharts, the output will include-

1. A diagnostic listing of the analyzed source decks.
2. A label table listing.
3. A cross-reference listing.
4. Various error reports.
 a. Blank labels.
 b. Undefined labels.
 c. Draw errors.
 d. Comment errors.

FEATURES -

- Ease in preparation of input data which may be in free or fixed format.
- Automatic page planning facilities.
- Direction of tranch flowlines by symbolic reference.
- Striping any block to indicate subroutines.
- Automatic footnoting of overflow block text.
- Up to three lines (of 120 characters each) of header information.
- Automatic or user designated pagination of printed charts.
- Automatic dating of charts.
- Sequenced label table listing.
- Crcss-reference listing.
- Diagnostic listing of input with error flags.
- High quality output with powerful line searching abilities.
- On and off-page connectors generated automatically.
- Automatic branch table generation.
- Reduced key punching requirements.
- Easy flowchart modification.
- Autochart symbols or the flowchart symbols for information processing can be specified.
- Unrestricted placement of lines or comments at any location.

PROGRAMMING SYSTEMS - The program will operate in conjunction with the IBM Disk Operating System/360 (DOS/360) and is used to produce flowcharts. The source language is DOS/360 Assembly Language and uses the EBCDIC Character Set.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model E30 (32K) with Standard Instruction Set... two 2311 Disk Storage Drives (one for systems residence and one for work file)... One 2540 Card Read Punch... One 1052 Printer-Keyboard... One 1403 Printer with 132 print positions using the PN or QN Chain Arrangement (PL/I).

Note - If a PN or QN Chain is not available, the following Delimiter Characters may either not print or else print as different characters - Percent, Colon, Semi-colon and Number Sign.

Optional Devices - One 2400 Series Tape Drive for System/360 Flowchart Language input, one 2400 Series Tape Drive for output.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory-Users Manual, H20-0293... Operators Manual, H20-0294.
MACHINE READABLE - Object modules, sample catalog control cards, Job Control cards and sample problem cards.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Systems Manual, Y20-0062.
MACHINE READABLE - Source cards, assembly listings and flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE22X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none

360A-SE-23X *M
SYSTEM/360 DATA CONVERSION AND LABEL PROCESSING SUBROUTINES

DESCRIPTION - The Data Conversion and Label Processing subroutines provide character translation from one character set tc another character set. They also provide conversion for floating point, binary, zoned decimal, packed decimal and double digit numbers. Conversion subroutines operate on current system number representations to produce System/360 number representations and also perform the reverse conversions, i.e., System/360 representations to current system representations. The label processing subroutines perform reading and checking of current system

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standard IBM labels. They will also generate and write current system standard IBM labels. Data files from the following current systems may be processed -

- 1401, 1440, 1460, 1410, 7010.
- 1620.
- 705, 7080.
- 7070, 7072, 7074.
- 7040, 7044, 7090, 7094.

Typical use of these subroutines might involve the gradual conversion of a large current system application to the System/360, wherein one or more data files must be shared between the two computers. The data conversion subroutines may be called by Assembly Language, or COBOL CALL statements. The Label Processing subroutines are implemented for usage at the non-standard label exits of TOS/360 and DOS/360 logical IOCS, and the non-standard label exit of OS/360. Reading and writing are responsibilities of the user (with the exception of label processing) since the data and character transformation performed by these subroutines is done with data as it appears in storage.

FEATURES -

- Allows user to continue to process current systems files alone or mixed with System/360 files on a System/360.
- Provides facility for file interchange between current system and System/360.

PROGRAMMING SYSTEMS - The subroutines are written in either System/360 Assembly Language or E Level COBOL. The subroutines may be assembled or compiled and entered into the TOS/360 or DOS/360 or OS/360 subroutine library.

MINIMUM SYSTEM REQUIREMENTS - The minimum system requirements are the same as the minimum system configuration for the operating system that is used. The label processing subroutines require at least one 2400 Magnetic Tape Unit, either 9-track or 7-track with the Compatibility Feature, and the floating point subroutines require the Floating Point Instruction Set. The Label Routines require the Decimal Arithmetic Feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Reference Manual, H20-0319 (contains Application Description, Users and Operators Information).
MACHINE READABLE - Source and object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Listings and flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE23X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01

360A-SE-25X
TEST/360 CONTROL CARD EDIT & ANALYSIS

DESCRIPTION - TEST/360 Control Card Edit and Analysis Program is a stand-alone program for editing network and message generation control cards. The primary purpose of the TEST/360 Control Card Edit and Analysis Program is to provide an efficient method of analyzing and editing these control cards.

Test/360 Control Card Edit and Analysis Program makes it possible to debug control cards prior to Datacenter use of TEST/360.

FEATURES -

- Edit of the 17 types of TEST/360 network and message generation control cards.
- Diagnostic messages and column indicators for each edit error found.
- Estimated core storage requirements for the TEST/360 simulation being specified.
- Summary report of system, line, and terminal specifications.
- Ability to edit several sets of TEST/360 control cards in one pass.

PROGRAMMING SYSTEMS - This program uses IBM/360 Basic Assembler Language and an 8K BPS Supervisor. The program will operate on its own, with no additional monitor required.

MINIMUM SYSTEM REQUIREMENTS - A 64K System/360 Model 30

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with 2540 Card Read Punch, 1403 Printer, 1052 Printer-Keyboard, and 2400 Tape Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Reference Manual, Y20-0116.
MACHINE READABLE - Object and sample program code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE25X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360A-SE-26X
SYSTEM/360 DATA CONVERSION UTILITY III

DESCRIPTION - The IBM System/360 Data Conversion Utility III provides an effective and flexible capability for customers to convert their current IBM system data files to System/360 data sets. This general purpose utility program accepts, as input, data sets in the format of the IBM 1620, 1400, and 7000 series systems and produces as output the data format desired for System/360. The program accepts card, tape, or DASD data sets from the above IBM systems (where IBM written DUMP or UNLOAD routines have been used when coming from a current IBM System DASD) and writes these data sets on System/360 tape or DASD units. The program has data transformation capability that allows the user flexibility in "resystematizing" his data sets for System/360. The data Conversion Utility III program accommodates the three general considerations in data conversions -

- The physical characteristics of the I/O device (i.e., 7-track tape format, delta mode change character).
- Current IBM Systems software standards (i.e., labels, padding characters, checkpoint records, etc.).
- Optimization of data representation (i.e., floating point, binary packed decimal, etc.).

Data Conversion Utility III is a set of interdependent macro definitions which may be generated in a variety of ways to create specific data conversion programs that meet the exact requirements of the users data set. The program is divided into two steps -

Step 1 - Assembling and generating a program -

The parameters of the macro statements are used to specify the characteristics of the users data file to be converted and the form of the converted output. The macro statements are then assembled and the resulting object modules are then combined to form a data conversion processing task in loadable form. The specific data conversion required on a data set is indicated by macro parameters as follows:

INPUT	Specific description of the current IBM system input data set. (record form, type of tape labels, record length, block length...).
MOVE/TRANSFORM	Relative location, size, and type of input field and its corresponding output fields relative location, size, and type.
OUTPUT	Specific description of the System/360 output data set (record form...).
USER	Specifies exits in the program that are to be activated and the name of the users task to which the program is to pass control when the exit is taken.

Step 2- Performing the Data Conversion -

The second step can execute the following four functions as originally specified in the macro statements.

1. Input of current IBM system data -
 - IBM standard label checking (80, 84, and 120 character labels).
 - Checkpoint elimination.
 - BCD fixed length tape records (with or without padding).
 - BCD variable length tape records (14XX/7080).
 - 7070/7074 tape Form 1, 2, 3.
 - 7040/7090 binary or mixed mode tape.
 - 1620/14XX DASD cards.
 - Card data files.
 - Code conversion of dual special characters.
2. Performing MOVE/TRANSFORM String Operations -
 The MOVE/TRANSFORM Strings can be used for multiple record types or to combine multiple records from the input data set into one output data record.
3. Output to System/360 Data Sets -
 Fixed length tape records (7- or 9-track).
 Fixed length DASD records.
 Variable length tape records (7- or 9-track).
 Variable length DASD records.
4. Executing User Modules -
 User routines as required (e.g., non-standard tape labels...). User exits are provided for such situations as non-standard current system labels on input. When user tasks are indicated, the user task(s) and the data conversion program will reside in storage together.

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FEATURES -

- The IBM System/360 users are provided a facility to reduce substantially the difficulties, time, and costs of performing the required data conversions.
- Allows greater flexibility for scheduling user manpower in new application areas where potential savings can be made. More of the manpower can be concentrated on the solution to the application problem, rather than the nature of the data.
- Encourages the user to write his IBM System/360 application programs using record organization and data formats which are optimum for the IBM System/360.
- Encompasses the requirements of current IBM System users, regardless of the machine size and configuration.
- Provides comparable data conversion facilities to users, regardless of the IBM System/360 language used.
- Designed for ease of user implementation.
- Allows the user to readily change his data storage media.
- Designed to allow the user to tailor the program to his individual requirements through user exits and modular program organization.

Data Conversion Utility III runs under control of TOS/360 or DOS/360. The program can be used for the permanent conversion of current IBM System data sets into System/360 data sets and can also be used to obtain "live" test data from current IBM systems for use in testing System/360 application programs. Since input data may be on 7- or 9-track tape, customers whose initial conversion to System/360 is planned around emulation will be able to use the Data Conversion Utility III program to convert their even parity, BCD 9-track emulator data sets when they convert their programs to System/360. The macro definitions which make up the Data Conversion Utility III program package must be cataloged in the users Source Statement Library. The user then writes the necessary DCU III macro statements (and user routines if required) to specify the desired data conversion program.

PROGRAMMING SYSTEMS - The IBM System/360 Data Conversion Utility III Program is written in TOS/360 and DOS/360 Macro Language as described in C24-3414. It is designed to run under control of TOS/360 or DOS/360. The following utility programs will be required to prepare the supplied program material - for TOS/360 Users, 360M-UT-403... for DOS/360 users, 360N-UT-462.

MINIMUM SYSTEM REQUIREMENTS - An IBM System/360, Model D30 (16K), with the Decimal Arithmetic Feature. The TOS/360, DOS/360 requirements of devices for system operation and program assembly are necessary for generating a Data Conversion Utility Program. The created Data Conversion Program requires the necessary devices for system operation, and in addition, input/output devices as required for the data sets are needed as follows-

- One 2400 Series Tape Drive for the input data set.
- 2540/2501 for 1620/14XX DASD or other data card input.
- One 2400 Series Tape Drive for the output data set.
- One DASD Device for the output data set.

Note - 2400 Series Tape Drives can be 9-track unless they interface with 729 Tape Drives, in which case the 7-track head and 7-track feature are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Programmers Manual, H20-0285... Operators Manual, H20-0286.
MACHINE READABLE - Control cards and macrc definition cards.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE26X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360A-SE-32X
SYNCHRONOUS TRANSMIT-RECEIVE ACCESS METHOD FOR DOS/360

DESCRIPTION - The program provides macro-instructions and routines to allow transmission and reception of data via the 2701 Synchronous Data Adapter - Type I connected to STR terminals, remote or local. User type macros and routines are provided to interface the Disk Operating System, maintain line control, diagnose and recover from transmission execute data transmission, and convert code. The access method provides a macro language at the assembler level to provide environment definition... Line Control... READ/WRITE level transmission... Data Translation... Error Recovery and Restart... Multiple Line WAIT with Error Checking. The program utilizing the STR Access Method macros and routines occupies one partition. The other partitions can be used by other programs within the scope of DOS/360.

FEATURES - The access method extends the Tele-processing support of DOS/360 to include STR terminals... the programming language is independent of line speed, allowing data transmission at speeds ranging from 1200 bps to 40,800 bps... CPU to CPU transmission is supported... automatic answer, manual dial, manual answer, and leased line operations are supported... Autocall (No. 1302 or No. 1303) is supported... the Dual Communications Interface feature (No. 3461 or No. 3462) is supported... the support is at the Assembly Language level.

PROGRAMMING SYSTEMS - Operates under Disk Operating System/360. Disk Operating System features required are Channel End Appendage capability (TP equals BTAM)... entries in the PUB table for the 2701 Synchronous Data Adapters... assignment of logical units to the adapters either at system generation or at job time by ASSGN statements. The executable routines provided by the access method are distributed as pre-assembled modules to be placed in the users Relocatable Library and Core Image Library. The Assembly Language macro definitions are to be placed in the users Source Library. The access method can then be used as though it were part of his DOS/360 system support.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30E or larger... one or more 2701's with Synchronous Data Adapter - Type I (No. 7695 or No. 7696); Model 20 with Communications Adapter; 1978 Terminal (RPQ) Models 1, 2, and 3; 1009 Data Transmission Unit; 7701/7702 Magnetic Tape Unit; 7711 Data Communications - Magnetic Tape; 1013 Card Transmission Terminal; 1974 Terminal (RPQ) Model 2.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory, Users Manual, H20-0346 Operators Manual, H20-0347... Systems Manual, Y20-0096.
MACHINE READABLE - Job stream delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360ASE32X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360A-SE-33X
SYNCHRONOUS TRANSMIT-RECEIVE ACCESS METHOD FOR OS/360

DESCRIPTION - The access method provides a Macro Language at the Assembler level to provide environment definition... line control... read/write level transmission... GET/PUT level transmission... buffer management... data translation... error recovery and restart... multiple event wait with error checking. The program utilizing the STR Access Method occupies one partition. The remaining partitions can be used by other programs within the scope of OS/360. User type macros and routines are provided to interface the operating system, maintain line control, diagnose and recover from transmission error, execute data transmission, convert code, and handle buffers.

FEATURES - The access method extends the Tele-processing support of OS/360 to include STR type terminals... line speed is under program control, allowing data transmission at speeds ranging from 1200 bps to 40,800 bps... CPU to CPU transmission is supported... automatic answer, manual dial, manual answer, and leased line operations are supported... Autocall (No. 1302 or No. 1303) is supported... the Dual Communications Interface feature (No. 3461 or No. 3462) is supported... the support is at the Assembly

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Language level, which allows maximum flexibility of use.

PROGRAMMING SYSTEMS - Operating System features required are OS/360 Option 2 (MFT) Release 11 or later...BTAM... UCB/S defined at SYSGEN for the 2701 Synchronous Data Adapter units. The executable routines provided by the access method are distributed as pre-assembled modules to be places in the users LINKLIB and SVCLIB; the Assembly Language macro-definitions are to be placed in the users MACLIB. The access method can then be used as though it were part of his OS/360 system support.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30E or larger... one or more 2701's with Synchronous Data Adapter - Type I (No. 7695 or No. 7696)... as terminals one or more System/360 Model 30 or larger with 2701 Synchronous Data Adapter - Type I (No. 769r or No. 7696); Model 20 with Communications Adapter; 1978 terminal (RPQ) Models 1, 2, and 3; 1009 Data Transmisstion Unit; 7701/7702 Magnetic Tape; 1974 Terminal (RPQ) Model 2; 1013 Card Transmission Terminal.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory, Users Manual (H20-0349) Operators Manual, (H20-0350) systems Manual (Y20-0097).
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source Modules.

ORDERING INFORMATION: Program Number 360ASE33X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 7DC/800	26	none
		DTR 9/1600	29	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 7DC/800	26	none
		DTR 9/1600	29	none

360A-ST-06X
VEHICLE SCHEDULING PROGRAM

DESCRIPTION - VSP provides a comprehensive tool in the planning and operating of a distribution and delivery system. It computes near-optimal routes for delivery of produces or services by a fleet of vehicles. Because of the wide range of program options, it can be applied to most fleet routing and delivery situations. The advantages over manual methods are: increased efficiency and speed of scheduling, improved routing, and cost reductions (through better fleet utilization).

VSP determines the routes a group of vehicles must travel to meet certain commitments in the delivery of service or products to customers at given locations. The program tends to optimize basic factors such as travel time and number of vehicles. VSP consists of two main sections, the Network Analysis Program and the Schedule Production Program. The first program analyzes a network representing the potential calling points by computing the second program can repetitively produce schedules which meet various restrictions such as route-time, speed, vehicle capacity, and customer requirements.

The program can be used to solve many types of delivery problems. In addition to fulfilling the daily routing function, VSP can also be applied to realign fixed routes, aid in determining feasible locations or warehouses and depots to service potential customers, plan for a new fleet, and provide statistical and cost data relative to the efficiency of a fleet.

Input to the Network Analysis Program can be either of two types - True Distance or Coordinates. Both methods are concerned with zones, not actual customers. A zone is defined as a delivery area (e.g., a shopping center, a postal zone, or a section of a city), which can contain from 1 to 225 customers. The true distance method considers distances over actual roads between all points, intersections, and zones. Individual speed can be specified for each road in the network, if desired. This method, while more time consuming to prepare, gives a higher degree of accuracy as the output file will represent the combined knowledge of a firms manual routing and dispatching departments. True distances are best suited for networks in which customer location can be determined in advance, with relatively few changes so that it needs to be run infrequently. Both methods produce a file representing all practical combinations of potential delivery zones.

The Schedule Production Program uses the output of the Network Analysis Program, together with the list of the calls to be made. It then prepares feasible routes approaching optimum loads and minimum travel time, within the restrictions imposed by the user; the most valuable

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result is that fewer vehicles may be required. The output of the program consists of a printed list of the recommended routes. A summary of the fleet utilization is also produced. All output is stored on disk and can be modified by the user to prepare a variety of specialized reports, including - Warehouse picking and loading lists, invoices in route sequence, special driver instructions; plus various analytical reports. The output can, of course, also be used as the entry back into the customers existing data processing flow. VSP can, therefore, be a link to a more fully integrated distribution system.

FEATURES - The features of the Schedule Production Program listed below are of particular interest as they allow the schedules to be tailored to meet specific demands of customer service and fleet utilization. These features are designed as options which are used only when requested by the user and can then be combined in almost any manner.

- Limited calling times by stop.
- Average time at all stops in addition to loading/unloading.
- Special additional time for an individual stop.
- Vehicle limits by calling point.
- Up to 255 different vehicle types and capacities.
- Modification of average vehicle speed.
- Earliest possible starting and latest possible finishing time for the fleet.
- Maximum route time by vehicle type.
- Maximum number of calls per route.
- Multi-compartment vehicles.
- Variable assignment of trailers to vehicles.
- Average unloading time per unit.
- Dual specification of load, e.g., weight and volume.
- Multiple day journeys.
- Low priority orders.
- Traveling time between calls within a zone.

USE - VSP consists of two basic parts which can be thought of as separate programs and run independently if desired. These are the Network Analysis and Schedule Production Programs.

After determining whether to use the true distance or the coordinate method of input, the user must prepare the appropriate network description cards for the Network Analysis Program. The output file from this first phase is then used as partial input for the Schedule Production Program. In addition, for this second phase, the user must specify the various delivery requests and restrictions, fleet descriptions, and limits to be imposed.

Output from the program consists of a suggested schedule for each route, a summary of fleet utilization, and disk storage of all output. Although the user is not required to write any additional programs, he may do so to create input for either phase or to expand the output from the Schedule Production Program.

CUSTOMER RESPONSIBILITIES -
- The user must be familiar with the options and features of both the Network Analysis and the Schedule Production programs.
- Capable user personnel must be assigned to choose between the true distance and the coordinate methods and gather the appropriate data. Sufficient time should be given to data gathering prior to implementation of VSP.
- Overall work standards and special requirements for each delivery must be documented prior to producing the first workable schedule.
- Some user programming may be required to tailor the input and output of the Schedule Production Program, as mentioned above.
- A period of parallel operation should be planned when both VSP and the Manual System are used. This will allow time to try various combinations of the program features to produce the desired routings.

PROGRAMMING SYSTEMS - VSP is written in Basic Assembler Language and operates under the IBM System/360 Disk Operating System (DOS). Use is also made of the DOS Sort/Merge.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model E25 (32K)... 1052 Model 7 and two 2311 Disk Storage Drives (which include provision for DOS/360 disk residence) with attached features ... 1442 Model N1, 1443 Printer Model N1... Multiplex Chan. provision for DOS Disk Residence.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... Program Description Operations Manual (H20-0506)... Application Description Manual (H20-0464).
MACHINE READABLE - Relocatable programs and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code and flowcharts for the Schedule Production phase of VSP.

ORDERING INFORMATION: PROGRAM NUMBER 360AST06X

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	1316	52	01
		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none

360A-UH-11X *M

SHARED HOSPITAL ACCOUNTING SYSTEM (SHAS)

DESCRIPTION - SHAS provides hospital accounting for the multiple hospital environment. The member hospitals are tied to the central computer facility by Teleprocessing terminals. The accounting applications are Patient Billing, Accounts Receivable, and General Ledger. Accounting for both inpatients and outpatients is provided. In addition to Medicare cost allocation, SHAS determines Medicare insurance proration facilitating the preparation of the Medicare Inpatient and Outpatient billing forms. The design of SHAS facilitates the addition of clinical or administrative user written programs. SHAS programs are designed to provide better administrative and operational control and reduce the ever increasing clerical load associated with hospital administration.

The SHAS applications operate in two modes - on-line entry of data and receipt of reports by means of Teleprocessing terminals and off-line data entry and reporting at the central data processing location. The SHAS programs provide the on-line facility for applications where immediacy of the information is significant (entry of charges, cash payments, request for demand bills, etc.) For other applications, receivable statement writing, etc., the central facility (with its high speed printer) is used directly.

FEATURES -

General -
- Input Edit Tables and Report Format Control provide flexibility at the users option to tailor the input and output for each application.
- Hospital Profile provides for individual hospital processing decisions and parameters tailoring SHAS program processing to each hospital on the system.
- The SHAS executive provides the capability for processing foreground and background programs. Several terminals can transmit and receive data concurrently through foreground programs while batch applications are processed by background programs.
- Job Accounting statistics including terminal and CPU utilization are logged internally and are available in report forms.
- Security is attained through input and data set identifications to limit access of data. Each hospital is permitted to inquire into or modify its data only.

EXECUTIVE
Manage communications lines... handle the timer... handle interrupts (e.g., demand bill request and inquiries)... queue messages... manage input/output.

PATIENT BILLING
Setting up patients files upon admission to hospital... central pricing of hospital services... charge posting... census... insurance proration (including Medicare)... record cash payments... Daily Balance forward printed at the hospital... inquiry on the status of patient accounts (detail and summary patinet bills)... automatic preparations of patient bills... automatic printing of insurance statements... automatic transfer to accounts receivable... accumulation of revenue and usage data for Medicare requirements.

ACCOUNTS RECEIVABLE
Preparation of statements... recording cash payments... receivable accounts stored either off-line receivables... listing of accounts which require a final diagnosis... listing of receivables by financial class... aged trial balance... listing of accounts which have insurance receivables... listing of accounts which fail to meet installment payments... consolidated statement for family billing... bad debt reports.

GENERAL LEDGER
Ledger posting... Trail Balance... Comparative Income and Expense Report... Balance Sheet... Operating Statement... cost allocation methods suitable for Medicare-stepdown and double apportionment.

USE - The SHAS system processes input data against patient and account master files. These files are established through procedures supported by the SHAS programs. Patient admissions and dismissals, charges, payments, and accounting transactions are processed for multiple or single hospitals. Teleprocessing provides an alternate input method and an

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alternate output for certain operational reports and inquiries. Volume output reports are printed centrally in a Teleprocessing system. File update and report jobs are controlled by the central operator through a higher level function language (series of cataloged job steps).

Balance and edit, maintenance, and error reporting programs process data for all applications. Update programs in each application maintain and back-up tape and indexed sequential disk master files. Report programs can select data for individual hospitals from billing and receivables tape and disk files. The Background Monitor supports function initiation and uniform restart capabilities for operator control. The Teleprocessing foreground monitor is assembled from user Teleprocessing network specifications.

PROGRAMMING SYSTEMS - The Shared Hospital Accounting System (SHAS) operates under the IBM System/360 Disk Operating System (DOS/360). The application programs are written in COBOL and Assembler Language. Also used are sort/merge and utility programs. Teleprocessing programs utilize Queued Teleprocessing Access Method (QTAM).

MINIMUM SYSTEM REQUIREMENTS - For Teleprocessing: 2030F Processing Unit (64K), Decimal Arithmetic (No. 3237), Floating Point Arithmetic (No. 4427), Interval Timer (No. 4760), Selector Channel - First (No. 6960), Selector Channel Second (No. 6961), Storage Protection (No. 7520)... 1052 Printer-Keyboard with appropriate attachments... 2821 Control Unit Model 1, 100 lines per minute Printer Adapter (No. 3615)... 1403 Printer Model N1... 1416 Interchangeable Train Cartridge... 2540 Card Read/Punch Model 1... 2841 Storage Control Model 1... three 2311 Disk Storage Drives Model 1... 2415 Magnetic Tape Unit and Control Model 1... 2701 Data Adapter Unit Model 1, Terminal Adapter - Type 1 (No. 4645) or 2702 Transmission Control Model 1, Terminal Control - Type 1 (No. 4615), Selective Speed (No. 9684), and IBM Line Adapters as required. System control terminal at the central computer site includes 1051 Control Unit Model 2, First Printer Attachement (No. 4408)... 1052 Printer Keyboard Model 2.

Terminal configuration at each hospital uses 1050 series equipment. Recommended are 1051 Control Unit Model 2, First Printer Attachment (No. 4408), First Reader Attachment (No. 4411), IBM Line Adapter (No. 469X), Line Correction (No. 4795), Line Correction Release (No. 4796)... 1052 Printer-Keyboard Model 2... 1056 Card Reader Model 1... 29 Card Punch Model A22*... 59 Card Verifier Model 2.

*Self-checking Number feature (No. 7062) may be additionally specified for card punch as desired by the user.

MINIMUM SYSTEM REQUIREMENTS - For Non-Teleprocessing - Processing Unit Model E(32K) with Decimal Arithmetic (No. 3237), Floating Point Arithmetic (No. 4427), Interval Timer (No. 4760), Selector Channel - first (No. 6960), Storage Protection (No. 7520)... 1052 Printer-Keyboard with appropriate attachments... 2821 Control Unit Model 1... 1403 Printer Model 2... 2540 Card Read/Punch Model 1... 2841 Storage Control Model 1... three 2311 Disk Storage Drives Model 1... one 2415 Magnetic Tape Unit and Control Model 1.

A 2025 Processing Unit Model E(32K) with Floating Point Arithmetic (No. 4427), Interval Timer (No. 4760), Selector Channel (No. 6960), Storage Protection (No. 7520)... Integrated 1403 Attachment (No. 4590)... 1403 Printer Model 2... Integrated 2540 Attachment (No. 4595)... 2540 Card Read/Punch Model 1... Integrated 2311 Attachment (No. 4598)... three 2311 Disk Storage Drives Model 1... one 2415 Magnetic Tape Unit and Control Model 1.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application directory... Shared Hospital Accounting System Program Description Manual (H20-0533)... Operations Manual (H20-0534)... Teleprocessing Operations Manual (H20-0550).
MACHINE READABLE
Contains the source program modules and catalog control cards, model job control statements, and data set file descriptions for compiling and cataloging into the core image and source library for program operation. Also included is a sample problem with control cards for execution.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360AUH11X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360A-UH-12X
AUTOMATED CHEMISTRY PROGRAM - CLINICAL AND ADMINISTRATIVE RECORD SYSTEM

DESCRIPTION - This program processes the punched card output of the IBM 1080 Data Acquisition System. Processing of 1080 punched card output - establishes the calibration function from control standards... checks the quality of the control standards used... computes the test result... adjusts the test result for instrument drift that might have occurred... adjusts the test result for interaction between specimens (high concentration followed by low concentration)... compares test result with mean and standard deviation of cumulative data for all results for that test... associates each test result with the proper specimen identification number.

Setting up a test result file - Sets up a file by specimen number, and test results for each test ordered... the data from this file can be transferred to and integrated with a patient master record by user-written routines.

Print out of Quality Control Report - prepares a quality control report for review by the laboratory prior to release of test data for distribution to the ward or clinic... the Quality Control Reports lists for each specimen processed - test result, dilution factor (if any), abnormal indication for 1 or 2 standard deviations, and specimen number.

FEATURES - This program encompasses the following unique features that produce more reliable test results - check reliability of control standards... adjust for analyzer drift... adjust for interaction of specimens with widely differing concentrations... report quality control information... flag abnormal test results for retesting of these specimens.

USE - This program is loaded into the library and called via job control cards... environmental data are loaded and retained on disk via a maintenance program included with the System/360 Automated Chemistry Program; this is a one time operation for a given operating environment... 1080 card output can then be processed.

The user is responsible for providing basic patient data, associating patient number and specimen number... setting up the 1080 by providing a description of which analyzer strip chart recorders are associated with which 1084, a description of the tests run on each 1084, test number and name, concentration of each calibration standard, control standards used, and chemistry procedure used.

PROGRAMMING SYSTEMS - Written in FORTRAN IV and Assembler Language. It is designed to operate under DOS on the System/360. The access methods used are direct and sequential. DOS Group II utilities are required for punching machine readable material from tape.

MINIMUM SYSTEM REQUIREMENTS - A 2030E 32K with Decimal Arithmetic (No. 3237), Floating Point Arithmetic (No. 4427), selector channel - first (No. 6960)... 1052 Console Typewriter with appropriate attachments... 1442 Card Read Punch Model N1... 1443 Printer Model N1... 2841 Storage Control Model 1... one 2311 Disk Storage Drive Model 1. The application program requires approximately 18.5K bytes of core storage exclusive of the DOS Supervisor.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory... System/360 Automated Chemistry Program (S/360 ACP) Program Description Manual (H20-0515)... Operations Manual (H20-0516).
MACHINE READABLE - Contains the control cards and object modules necessary to load the program into the Core Image Library and a sample problem with control cards for execution.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360AUH12X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
		CARDS	15	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none

360A-US-06X *M
IBM STUDENT SCHEDULING - TALLY AND CONFLICT MATRIX PROGRAMS

DESCRIPTION - The Tally Program accumulates the number of student requests for each course offered in the school

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curriculum. Two options are provided -- course totals by male-female breakdown only... course totals by male-female breakdown and by grade. A maximum of 500 courses may be tallied in any one run. The Conflict Matrix Program points out potential scheduling conflicts. It counts all paired combinations of student requests for courses and displays these counts in matrix reports. Two options are provided -- a conflict matrix... a conflict matrix with identification of the students who have the potential conflicts entered into the matrix. A students identification is printed only with those requested courses that are matrix entries. A maximum of 250 courses may be entered into the matrix.

FEATURES -
- One-pass runs for both tally and conflict matrix.
- Variable length grade titles (one to four characters, alphameric).
- Variable length course codes (three tc six characters, alphameric).
- Packing of course codes on student request cards.
- Blank course fields acceptable.
- Common course card addition of up to 10 course requests to request made in normal fashion.
- Specification and checking of maximum number of requests allowed per student.
- Continued later usage of master schedule cards used for conflict matrix input.
- Input sequence not disturbed by errors -- no stacker selection.
- A maximum of 40 course requests allowed per student.

Both the Tally and the Conflict Matrix programs are used to furnish data a school organization needs to create the best possible master schedule of course and section offerings. The programs are employed prior to the use of the scheduler programs of Student Scheduling System/360.

PROGRAMMING SYSTEMS - The Assembler Language with input/output macros (8K disk) is used (360B-AS-309). Both programs can run under control of the Basic Operating System/360, 8K disk, or under the System/360 Basic Programming Support.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Processing Unit, Model F with decimal arithmetic (No. 3237)... 1051 Attachment (No. 7915)... 1051 Control Unit Model N1, CPU Attachment (No. 3130), First Punch Attachment (No. 4410), First Reader Attachment (No. 4411)... 1052 Printer-Keyboard Model 6... 2821 Control Unit Model 1... 1403 Printer Model 2... 2540 Card Read/Punch Model 1.

The Tally program will run in 32K, provided that the supervisor being used does not exceed 5,200 bytes, and the conflict matrix programs may be easily modified by the user to run in 32K with a reduce course capacity in the matrix.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... Application Description, (H20-0202)... Users Manual, (H20-0220).
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Systems Manual.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360AUS06X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360A-US-07X
STUDENT SCHEDULING

DESCRIPTION - Using a master schedule prepared by the school, Student Scheduling System/360 processes student course requests to create student schedules, class lists, and an updated master schedule. Two auxiliary programs, the tally and conflict matrix programs, 360A-US-06X, are used tc furnish the school adminstrator with data pertinent to master schedule creation. These programs are already available. It contains improvements over similar student scheduling programs issued previously. Flexibility is enhanced by new program features such as greater study hall flexibility, ccmmon course input, and expanded pre-run edit, and alternate course substitution. Parameters ccntrolling numbers of periods per day, courses offered, sections per course, and totoal number of sections have been significantly enlarged. The user has greatly increased control over punched and printed student schedule and class list format.

FEATURES - Variable length alphameric course codes (three to six characters)... increased period, section, semester, and days capacity... increased course description fields... unique descriptions for each period of blocked courses...

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common course request input... improved pre-scheduling editing... female - male balancing of classes... alternate course scheduling... partial scheduling for students with conflicts... reject matrix output for students with conflicts... daily study hall class lists... independent editing of punched and printed output... sub-heading lines may be added or printed reports... use of on-line disk storage increases the efficiency of the program... core storage is employed for table structuring. It is also used to contain part or all of the master schedule, reducing processing time... the scheduling program is modular in construction, consisting of five distinct phases. The input, student schedule output, and class list output phases may be run individually... the linkage editor function within the Basic Operating System/360 8K Disk Version, can be used to ling the standard scheduling program to special output routines.

The scheduler reads all types of scheduling input, creates student schedules, and updates the master schedule. The student schedules are stored on disk and may be sorted into class list sequence, which are stored on a second disk pack. Updated master schedule, student schedule, and class list output may be punched and/or printed; student schedule and class list output may be saved on disk for use at a later date.

PROGRAMMING SYSTEMS - The Basic Operating System/360, 8K Disk Version, is used to control the scheduling program. The scheduler is written in the IBM Basic Operating System/360 Assembler with Input/Output MACROS (8K disk). If class list output is desired, the Basic Operating System/360 Sort/Merge (8K disk) program is required.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Processing Unit Model F with Decimal Arithmetic (No. 3237) and 1051 Attachment (No. 7915)... 1051 Control Unit Model N1 with CPU Attachment (No. 3130), First Punch Attachment (No. 4410), and First Reader Attachment (No. 4411)... 1052 Printer-Keyboard Model 6... 2841 Storage Control Model 1... three 2311 Disk Storage Drives Mcdel 1... 2821 Control Unit Model 1... 1403 Printer Model 2... 2540 Card Read/Punch Model 1.

Two disk units are required for the scheduler program in addition to the one disk unit required for the 8K Disk Basic Operating System and other non-scheduling data. If no class lists are desired, only one extra disk unit is needed.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory; Application Description (H20-0202)... Users Manual (H20-0239).
MACHINE READABLE - Object program, job control card decks and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - System Manual.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360AUS07X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		1316	52	01

360A-UX-01X *M
COURSEWRITER III

DESCRIPTION - Coursewriter III is a program that can be used with System/360 Models 30, 40, 50, 65 or 75 to develop and present course materials for Computer Assisted Instruction (CAI).

Coursewriter III can be used for educational research, curriculum devlopment, and operational uses of Computer Assisted Instruction. Course materials may be designed for basic or supplemental instruction and can include pretests to assess student capabilities, drill and practice problems and laboratory simulations.

The System/360, through IBM 1050 or 2740 terminals, interfaces directly with students, authors of curriculum materials, monitors who assist students, and supervisors of the CAI installation.

Coursewriter III applications exist primarily in the following areas:
- Teaching and learning research
- School and university instruction
- Industrial and military training

The Coursewriter III programming system is made up of four

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elements:
- Coursewriter III Author Language
- Coursewriter III Processor Program
- Coursewriter III Input/Output Control Program
- Coursewriter III Student Response Processor

These elements, under control of the Disk Operating System/360, store, present, and administer the author-prepared course materials.
Disk Operating System/360 is a disk-resident system composed of control programs and processing programs configured in the system generation of each individual installation. Multiprogramming is included as a facility which enables System/360 to process a background job and foreground jobs simultaneously. The Coursewriter III program will normally be run in the highest priority foreground partition. The Teleprocessing operations of DOS/360 manage the line communications with the IBM 1050 or 2740 terminal stations.

The Coursewriter III Author Language provides capability for the development and presentation of educational course materials through the terminals.
This special language enables authors to control computer presentation of course material and processing of student responses. The contents and techniques of instruction can vary widely depending on the type of student, the learning environment and the performance objectives of the course.

The Coursewriter III Processor Program operates interpretively and contains the control routines, author routines, student and monitor routines, and supervisor routines. Together, these routines direct System/360 to perform the specific tasks initiated by its users.
The Coursewriter III Input/Output Control Program maintains the current status of communication lines and their associated terminal stations.
A Coursewriter III Student Response Processor Utility Program is also included which extracts and prints from selected records from the Coursewriter III recording tape.

FEATURES - Coursewriter III provides essential language, p processor, and control program capabilities that enable:

- Authors to write and correct course material.
- Data to be collected on student responses for later analysis.
- Authors or programmers to add new functional capabilities to the Coursewriter III language for unique requirements.
- A macro capability to be used for easier development of repetitive course routines.
- As many as 161 independent 1050 or 2740 terminals to be serviced when a System/360 Model 50, 65 or 75 is used.

USE - IBM System/360 Models 30, 40, 50, 65 or 75 serve as central processing units for Coursewriter III instructional systems. The CPU can access course material from 2311 or 2314 Disk Storage Drives, interpret course statements, analyze student responses and control data flow between the CUP and system terminal stations.

Removable 1316 or 2316 Disk Packs store the course materials along with individual performance records and other administrative materials.

IBM 1050 and 2740 terminals are used by students to receive instruction and by course authors to input and modify instructional materials.

PROGRAMMING SYSTEMS - Coursewriter III is written in DOS/360 Assembler language. It operates under the control of DOS/360 with the multiprogramming feature. The interval timer is required. The Direct Access Method is used for disk, Sequential Access Method for tape and BTAM for teleprocessing.

MINIMUM SYSTEM REQUIREMENTS - A 2030 Model F Processing Unit with Decimal Arithmetic (#3237), First Selector Channel (#6960), Storage Protection (#7520), 1051 Attachment (7915), and Interval Timer (#4760)...1051 Control Unit Model N1 with CPU attachment (#3130)...1052 Printer-Keyboard Model 8...1442 Card Read Punch Model N1...1443 Printer Model N1 with Selective Character Set (#6402)...2841 Disk Storage Control Model 1...two 2311 Disk Storage Drives Model 1...2803 Tape Control Model 1...2401 Magnetic Tape Unit, Model 1...2701 Data Adapter Unit Model 1 with Terminal Adapter (#4645)...2740 Communication Terminal with Record Checking (#6114).

As many as 161 IBM 1050 or 2740 terminals may be connected to a System/360 Model 50, 65, or 75 through remote dial-up or dedicated voice grade lines. A user selects one of three transmission control units according to the number of terminals to be serviced by the system. The 2701 Data Adapter Unit handles up to four lines while the 2702 Transmission Control Unit, with a Speed Extension feature (7387) can handle up to 31 half-duplex communication lines. One 2703 Transmission Control Unit, can service up to 176 half-duplex lines simultaneously operatirg at speeds up to 180 bits per second.

The 2701 Data Adapter Unit regures special feature 4645; the 2702 requires special features 3233, 4615, and 7955; the 270 requires special features 7505, 4878, 4619, 4696, and a 3205 (for every eight lines). Each 1051 Model 2 terminal must be

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equipped with feature 4408, each 1052 Model 2 with feature 1006, each 2740 Model 1 with feature 6114.

Either the tape or the printer is required as a system log device in the minimum configuration. To record student responses, and at the same time perform functions such as print course, course off/on, one tape must be added for each such function performed.

Coursewriter III will accommodate the following sample configurations along with a background job under control of DOS/360:

Model	Core Size	CoursewriterIII Partition Size	Number of Terminals
30	64K	44K	15
40	128K	108K	62
40	256K	170K	124
50	256K	220K	161

The number of terminals a system can handle will depend upon the amount of core storage available and the response time required. The response time to the student will be dependent upon many factors, including:

- System configuration.
- The complexity of the courses being used.
- The number of terminals in use.
- The type of background job being run.
- The number and type of buffer areas allocated at Coursewriter III system generation time.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory...Author's Guide H20-0609...Supervisors Guide (H20-0610)...Student Monitor Users Guide (H20-0608).
MACHINE READABLE - Program object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code, assembly and flowchart listings.

ORDERING INFORMATION: PROGRAM NUMBER 360AUX01X

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	9/800	28	none
		DTR	9/1600	29	none
OPTIONAL	none	MT	9/800	28	01
		MT	9/1600	29	01

360B *M

IBM SYSTEM - BASIC OPERATING SYSTEM

DESCRIPTION - BOS/360 is a Disk Resident System designed to provide operating system capabilities for 8K and larger System/360 configurations.

MINIMUM SYSTEM REQUIREMENTS - The IBM 1285 Optical Reader, which is used to read printed paper tapes directly into the system. Up to eight units can be attached. A byte multiplexing function is included that permits the interleaving of the 1285 with other I/O devices that operate in the byte mode. Up to twelve devices (for example - 1442 Card Read Punch, 2501 Card Reader or additional 1285 Optical Readers) may cperate in this mode.

360B-CL-302 Basic Control Program

Framework of the Basic Operating System/360. It prepares and controls the execution of all other programs executed. The basic control program is a prerequisite tc any program in the Basic Operating System. Also a prerequisite is the Initialize Disk Utility Program. Therefore, all users of Basic Operating System must order the Basic Control Program, 360B-CL-302, and the Initialize Disk Utility Program, 360P-UT-069.

The control program consists of -
- Supervisor - handles all input/output operations, conditions, and other functions for all prcblem programs.
- Job Control - runs between jobs and prepares the system for execution of all other programs.
- IPL Loader - loads the supervisor into main storage when system operation is initiated.
- Linkage Editor - all user programs must be read from cards, tape, or the Relocatable Library and edited into the Core Image Library of the system disk pack by this program. These programs can be permanently placed in the system, requiring only control cards to call them for execution, or they can be stored temporarily, executed, and then overlayed in the Core Image Library by new programs. Multiple queues may be generated without specifying a 1285 as one of the devices present. Multiple byte mode deviced (including the Synchronous Data Adapter

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Type 1 (may be run simultaneously on one multiplexor channel. The Universal Character Set features is also supported in the Basic Control Program.
- Librarian - This is actually a group of programs, used for maintaining and reorganizing the disk library areas and providing printed and punched output from the libraries.
- Core Image Library (REQUIRED) - All programs (IBM supplied and user programs) are loaded for execution from this library by the system loader routine of the supervisor.
- Macro Library (OPTIONAL) - Used to store IBM supplied and user-defined macro routines in resident packs built to provide program-assembly capability.
- Relocatable Library (CPTICNAL) - Required for assemble-and-execute operations, utilities (Group 1, except the Clear Disk Program, and Group 2), and for Autotest. It can be used to store assembled object modules for subsequent linkage for other program sections when editing programs into the Core Image Library.
- Load System Program - Operating as an independent program (Loaded from cards, with its own IPL program, supervisor and job control program), the load system program builds a disk resident system from cards. This program can be used to build minimum systems for specialized applications. If two disk drives are available, the librarian can be used instead of the load system program to build specialized systems.

*** IOCS ***

Consecutive Processing Macros 360B-IO-303

Consecutive-processing routines are used to read, process, and write successive records in a logical file. These routines apply to all files in serial-type I/O devices. The card readers, card punches, magnetic tape units, and printers are serial-type devices. Also, these routines can be used for 2311 Disk File records to be processed in a serial manner.

Indexed Sequential File Management System 360B-IO-304

(ISFMS) routines are provided to take advantage of the flexibility of the 2311 Disk Storage Drive. These routines provide a comprehensive method for establishing and maintaining logical files in a manner which allows random and sequential processing in the same file.

The Direct Access Method 360B-IO-305

(DAM) provides READ, WRITE, WAITF, and CNTRL macro instructions for processing 2311 disk files only. The DAM macro instructions can be used to create and maintain logical files in random order.

360B-UT-300 Group 1 Utilities

- Clear Disk - clears one or more areas of 2311 Disk Storage, and, establishes a preformatted track containing base throughout the area cleared.
- Card to Disk - transfers binary or EBCDIC data from cards to disk with or without key fields.
- Disk to Card - transfers data from disk to cards. The disk file may or may not have key fields. Data may be punched in either EBCDIC or binary.
- Disk to Printer - prints a disk file in either the Data Display format or the Data List format. Both formats are explained under the tape to printer program. Disk records may or may not contain key fields.
- Disk to Disk - transfers the data from one disk file to another. the input and/or output file may or may not contain key fields. The disk file may be copied, reblocked, field selected or reblocked and field selected.
- Card to Printer and/or Punch - transfers binary or EBCDIC data from cards to a printer and/or a card punch.

360B-UT-301 Group 2 Utilities

- Card to Tape - transfers binary or EBCDIC data from cards to magnetic tape.
- Tape to Printer - prints a tape file in one of two formats -
 - Data Display - prints all, in a series of lines, of the tape block using 100 print positions for the data (with top and bottom scale line, and page numbering). Twenty positions for the printer line are used for block size, Block number and record number. Field selection of data is not available with this option.
 - Data List - prints one line for each data record. The data, if larger than the print span, would usually be edited to printer size by using the "field select" feature of the utility program. Some other options for the user include page numbering, heading lines and spacing control.
 - Tape to Card - Transfers data from magnetic tape to cards. Data may be punched in either EBCDIC or binary.
 - Tape to Tape - transfers the data from one tape to another. The tape file may be simply copied, block by block; or reorganized by altering the number of altering the number of records in the block

CONTINUED FROM PRIOR COLUMN

(reblocking); or reorganized by deleting or re-positioning the file within the record (field select) as well as reblocking.
 - Disk to Tape - transfers data from one disk file to a tape file. the disk file may or may not contain key fields. The tape file may be copied, reblocked, field selected or reblocked and field selected reblocked and field selected.
 - Tape to Disk - transfers data from a tape file to a disk file. The disk file may or may not contain fields. The tape file may be copied, reblocked, field selected or reblocked and field selected.
 - Tape Compare - compares two files from two or more tape reels to insure that the files are identical. The number of reels in each file need not be identical. Files containing mixed, variable or or undefined record lengths may be compared. Physical records which do not compare are documented along with an index indicating the bytes that do not match, and the physical record number. A user routine may be supplied for processing on unequal compares. A compare may be terminated and a new compare initiated at any time.

Remote Job Entry Work Station Program 360B-CQ-311

This program works in conjunction with the OS/360 Remote Job Entry (RJE) system to provide a convenient means of entering OS/360 jobs to central computing system from a remote location equipped with System/360. It accepts OS/360 jobs and RJE control statements and commands from a card reader or 1052 Printer-Keyboard, transmits this data to the central (OS/360) processor via high-speed communication lines, receives data from the central system, and outputs this data to an attached output device (printer, punch or console printer), or passes it to a user-written routine. The console printer-keyboard can not be used for input and output of jobs.

Without the inclusion of user-written routines, a S/360 with at least 16K of main storage, a 2701 Data Adapter Unit equipped for Binary Synchronous Communication in EBCDIC Transparency Mode, a card reader, a printer, a 1052 Printer Keyboard, and a card punch are required for RJE operation. If user-written routines are included, a S/360 with at least 24K bytes of main storage is required. BOS/360 minimum device requirements apply.

Autotest 360B-PT-306

Autotest is the debugging aid for object programs that have been assembled by the assembler. Using Autotest, runs can be planned to proceed with a minimum of operator intervention. (For use on systems with at least 16K bytes of main storage). Autotest resides on disk (SYSRES) during testing. It controls testing and allows the exchange, addition, or deletion of instructions without reassembly. Allows replacement of constants.

Provides the dump of all or any portion of main storage, permanent storage assignments, and/or general registers/floating registers whenever a designated address is reached during object program execution. Such test request output can be regulated even within user program loops.

Symbolic debugging features are available. End-of-job main storage printouts can reflect user assembled labels associated with the appropriate main storage locations. Also, address for test requests and patches can be referenced symbolically.

Will print out main storage at abnormal end-of-job, and optionally at normal end-of-job. Pre-Scan loading of the object program and clears unused main storage. Allows execution of BOS resident utilities/user utilities to be run prior to or following execution of the user test program. A Card to Tape utility is supplied to generate variable length tape records. Allows assembly and immediate test capability.

Teleprocessing Input/Output Support for Binary Synchronous Communication 360B-CQ-312

Binary Synchronous Communication Macros are provided for an IBM S/360 via a 2701 equipped with an SDA-Type II Adapter to another S/360 (Model 30, 40, 50, 65, 67-65 mode, or 75), via -

(a) A 2701 equipped with an SDA-Type II Adapter,
(b) A 2703 equipped with Binary Synchronous features.

This support is for point-to-point non-switched and switched lines. Included within this support are the 2701 error recovery procedures and error counts. Macros will be provided to handle the following binary synchronous line control functions --

- Contention (point to point).
- Headers and normal text.
- Inquiry and alternating replies.
- WABT (optional).
- Full transparent text.

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- Dial with and without identification.
- Disconnect and conversational.

EBCDIC will be supported as the transmission code. The minimum core storage requirement is 16K bytes. BOS/360 Binary Synchronous Communication support communicate with

other System/360's using DOS/360 BTAM, OS/360 BTAM and BCS/BPS/360 Binary Synchronous Communication support.

Note - 2701 support on a selector channel is limited to non-switched. (leased or private direct connection).

360B-RG-307 Report Program Generator

The Report Program Generator (RPG) is a problem oriented language designed to provide users with an efficient, easy-to-use technique for generating programs that can:

- Obtain data records from single or multiple input files.
- Perform calculations on data taken from input records or RPG literals.
- Write printed reports.
- Use table lookup.
- Exit to a users subroutine written in a language other than RPG.
- Branch within calculations.
- Sequence-check input records.
- Provide user specified tape rewind/unload options.
- Allow assignment of dual I/O areas to be specified.
- Bypass repetetive Master Record searching.

Note - The Decimal Arithemtic feature No. 3237 is required by RPG.

360B-SM-308 Sort/Merge

The Sort/Merge Program that is provided here, enables the user to sort a file of records into one sequential file. The control data information can be contained in as many as twelve fields in each record. The program assumes that input records for sort operation are in random sequence. Records can be sorted or merged into ascending or descending sequence, and an indivudual sequence can be specified for each control-data field. The output sequence for a merge-only operation must be the same as the input sequence. Files to be sorted can be read by the program from IBM 2311 Disk Storage (except ISFMS), IBM 2400-series magnetic tape, or from cards read through any of the card readers listed under minimum system requirements. Output files can be written on disk storage or magnetic tape. An option provided by the program is a list of disk storage addresses that reflects the sorted output file. The user is also permitted to enter his own subroutine to handle any unreadable tape blocks from the sort or merge input file.

360B-SV-032 1070 Process Communication Supervisor

The program consists of the following components -

- Executive routine - with the aid of the BOS supervisor it controls the handling of interrupts and schedules line operations on a priority basis. It simulates a real-time clock and a series of interval timers. Further, it informs of errors detected, records the status of the lines and of the remote terminals and performs automatic code conversion between line code and EBCDIC within the System/360 Processor. The user derives this routine, tailored to his configuration by assembling three types of macro instructions.
- Conversion Subroutine - calibrates the ADC of the 1070 systems and converts analog readings to a standard range.
- Delta Limit Check Subroutine - performs limit and/or delta checks on converted analog readings.
- Contact Sense Subroutine - Compares current contact sense readings with a master mask or with previous readings.
- Thermocouple Subroutine - generates temperature values from converted thermocouple readings.
- Pulse Counter Subroutine - performs blank, delta and limit checks on incoming readings from pulse counter inputs at the 1070 terminals.
- Binary to Decimal String Routine - converts a binary string into an EBCDIC character sequence, consisting of the digits 1 and 2. This routine is designed for entry prior to performing a contact operate function at the 1070 terminal.
- Decimal to Binary Subroutine - converts a sequence of three-byte EBCDIC numbers to a sequence of binary integers,each in two bytes. This routine is for code conversion of incoming AEC readings from 1070 Terminals when the user does not want to use the conversion routine, which includes its own decimal to binary conversion.
- Decimal to Binary String Routine - converts a series of string. This routine performs the reverse process of the binary string to decimal routine and is for conversion of incoming readings from contact sense points in 1070 terminals when the user does not wish to use the contact sense routine, which has its own decimal to binary string conversion built in.

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- Diagnostic Write Routine - is used as a subroutine by some of the other subroutines. It prints error messages on the console typewriter.

The PCS macro definitions are inserted in the BOS Macro Library by a MMAINT run and the subroutines are inserted in the BOS Relocatable Library by a RMAINT run. The PCS provides the facility to communicate with the 1070 Process Communication Terminals, 1030 Data Collection Terminals and 1050 Data Communications Terminals, through a 2701 Data Adapter Unit or a 2702 Transmission Control. In addition, all IOCS facilities provided by the Basic Operating System may be used.

360B-AS-309 Assembler

This assembler program provides a convenient means of solving problems by offering the full flexibility of the powerful System/360 instruction set. This easy-to-use symbolic language is machine oriented and applicable to both commercial and scientific problems. The Assembler Language includes a complete set of Macro instructions for all I/O and other Supervisor functions. Also, the user can define frequently used routines as macros. The actual problem coding is done with symbolic instructions that are translated, one for one, to machine instructions. All storage references can be made through symbolic names. Data constants can be defined in several different ways, either as explicit constants or as literals coded directly into the operand of an instruction. Contains compile time punch check recovering routines.

360B-IO-310 Synchronous Transmitter Receiver Macros

These macros provide programming support for System/360 Models 30, 40, 50, 65 or 75 with a 2701 Data Adapter Unit and Synchronous Data Adapter Type I (No. 7695 and No. 7696), Communicating with synchronous transmitter receiver devices as follows -

- System/360 Model 20 with the Communication adapter, No. 2073.
- Systems/360 Models 30, 40, 50, 65 or 75 with a 2701 Data Adapter Unit equipped with the Synchronous Data Adapter Type I (SDA-1).
- 1978 Print-Read-Punch Terminal Model 1, 2 and/or 3.
- 1009 Data Transmitter Unit.
- 1013 Card Transmission Terminal.
- 7701 Magnetic Tape Transmission Terminal.
- 7702 Magnetic Tape Transmission Terminal.
- 7711 Data Communication Unit.
- 1974 Model 2 Data Transmission Terminal (RPQ unit).

NOTE - STR with dial requires a 16K environment. Most applications without dial will probably also require 16K, however, utility type applications requiring minimum processing and code conversion are supported in an 8K environment.

Macros are provided to -
- Handle transmissions and reception of data in the synchronous transmitter receiver (STR) mode.
- Assist the programmer in the processing of STR records.

MINIMUM SYSTEM REQUIREMENTS - 8, 192 bytes of core storage, Model 30... (a 16K System/360 Model 30 is required for the Autotest Program, 360B-PT-306)... Standard Instruction Set. The Report Program Generator (RPG) also requires the Decimal Arithmetic Feature No. 3237... The Synchronous Transmitter Receiver Macros, 360B-IO-010, also requires one 2701 Data Adpter Unit equipped with the Synchronous Data Adapter Type I (not required for assembly) and any STR supported terminal or remote processor (not required for assembly). Either one multiplexor or one selector channel... one 2311 Disk Storage Drive... one card read/punch (1442 N1 or 1442 N1 and 1442 N2, 2540, 2520 or 2501 and 2520... one 1403, 1404 or 1443 Printer)... at least one of the following - 2401 or 2402 Magnetic Tape Unit, Model 4, 5 or 6, and 2803 or 2804 Tape Control, Model 4, 5 or 6. The 205 Card Reader, the 2671 Paper Tape Reader and the 800/1600 bpi Dual Density feature are also supported. 1052 Printer/Keyboard recommended for efficient system communication. The execution of the PCS, 360B-SV-032 Object Program requires 16K bytes of core storage... Standard Instructions Set... Interval Timer... 1052 Console Printer... and 2701 Data Adapter Unit and/or 2702 Transmission Control.

BASIC PROGRAM PACKAGE

DOCUMENTATION - Program material list. The following publications, appropriate to the component ordered, will be delivered by PID with each initial order:

Publication	Form #
Sort/Merge Specifications	C24-3321
System Generation and Maintenance	C24-5060
Specifications, Assembler with I/O Macros	C24-3361
Macro Definitions Language	C24-3364
Programming Guide	C24-3372
Autotest Specifications	C24-3378
RPG Specifications	C24-3387
Utility Programs Specifications	C24-3409

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Cntrcl Programs and Assembler Operating Guide C24-3450
Autotest Operating Guide C24-3452
RPG Operating Guide C24-3453
Sort/Merge Operating Guide C24-3454
Utility Programs Operating Guide C24-3455
Operating Guide, Operator Messages C24-5024
1070 Process Communication Supervisor, Operating Guide C24-3627
1070 Process Communication Supervisor C24-5996

MACHINE READABLE - Program components may be selected from the following list. Each compcnent for which program documentation and maintenance material is required must appear on the order form.

Program Title	Program Number	Program No. Extension
	360B	none
Assembler	AS309	
Basic Control Program	CL302	
Consecutive Processing Macros	IO303	
ISFMS Macros	IO304	
DAM - Direct Access Method Macros	IO305	
Synchronous Transmitter Receiver Macros	IO310	
Autotest	PT306	
Report Program Generator	RG307	
Sort/Merge	SM308	
Group 1 Utilities	UT300	
Group 2 Utilities	UT301	
1070 PCS	SV032	
ESC	CQ312	
Remote Job Entry	CQ311	

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Material List - Optional material instructions. The dumped disk pack data on the tape will te preceded by an initialize 2311 utility program and a tape-to-disk program. The operating instructions fcr creating a system pack from the tape are provided with the material list.
MACHINE READABLE - The following program components are delivered (in scurce form).

Program Title	Program Number	Program No. Extension
	360B	none
1070 PCS	SV032	
Utilities Group 1	UT300	
Utilities Group 2	UT301	
Basic Control Programs	CL302	
Autotest	PT306	
RPG Report Program Generator	RG307	
Sort/Merge	SM308	
Assembler	AS309	

CRDERING INFORMATION: SYSTEM NUMBER 360E

Note: Both basic and optional machine readable material for this system is ordered by specifying a "System Line" (Columns 1-7, 15-24) and "Component Lines" (Columns 8-12) of the Program Order Form. Enter a separate Component Line for each component desired. Respecify the system line for each different Program Number Extension.

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
		1316	52	01
OPTIONAL	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360C-CE-701
COBOL LANGUAGE CONVERSION PROGRAM

DESCRIPTION - It aids in the transition to System/360 by converting acceptable current COBOL Languages to either System/360 Level E COBOL or Level F COBOL.

Acceptable Languages -- The COBOL LCP will accept as input -

1401/1440/1460 COBOL
1410 COBOL
1410/7010 COBOL
7040/7044 COBOL
7070/7074 COBOL
7070/7074 FCS COBOL
705/7080 COBOL
7090/7094 COBOL

FEATURES -
- Card or tape input -- both the LCP and the COBOL source programs can be read from either cards or tape.
- Single or stacked program conversion -- a single source program can be processed from one of the three tape units needed in a minimum configuration. Stacked programs can be processed if more than three tape units are used.

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- Replacing the environment division -- a control card option allows the user to replace the original environment division with a new customer-written System/360 environment division.
- Card-code conversion for dual BCD characters -- a control card option provides automatic conversion from BCD input code to EBCDIC output code, or vice versa. In this way, the LCP can convert the dual BCD characters, for example, two characters with the same card code, into the proper System/360 card codes.
- Documented listing -- the LCP provides a listing of the source and converted programs. This listing contains numeric codes that document conversion actions and facilitate analysis of the converted program.
- Optional card output -- when specified, the LCP produces a punched-card deck that contains the converted program.
- Optional output on tape -- the user can specify that printed and/or punched output are to be recorded on tape.

Conversion savings - The COBOL LCP will reduce the amount of reprogramming necessary to convert current COBOL programs into System/360 COBOL programs. Use of the LCP will reduce time and money spent on recoding, clerical activities, and program debugging. Although the savings to be realized will vary for the indivudual source programs, the typical savings will be 50 percent of the total COBOL program conversion effort consisting of statement conversion, compilation, and debugging.

MINIMUM SYSTEM REQUIREMENTS - An 8K 1401 system with ... a 1402 Card Read/Punch... a 1403 Printer Model 2... three tape units... the Advanced Programming Feature... the High-Low-Equal Compare feature (or an IBM System/360 with 1401 compatibility and corresponding features and I/O devices).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Write-up. Program Material List. COBOL Transition Aids Manual.
MACHINE READABLE - COBOL Language conversion object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - COBOL Language conversion source code.

ORDERING INFORMATION: PROGRAM NUMBER 1401CB701

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7/556	22	none
		DTR 7/800	24	none
OPTIONAL	none	MT 7/556	22	01
		MT 7/800	24	01

360C-CV-710
FORTRAN IV-TO-PL/I (F) LANGUAGE CONVERSION PROGRAM

DESCRIPTION - The FORTRAN IV-to-PL/I (F) Language Conversion Program (LCP) assists customers in the transition from FORTRAN IV-to-PL/I (F).

PROGRAMMING SYSTEMS - The LCP, intended for operation within the OS/360 is written principally in PL/I (F), though it includes certain routines written in Assembler Language. These latter perform table look-up and special types of conversion.

MINIMUM SYSTEM REQUIREMENTS - The machine requirements depend on the type of run to be made: A conversion run or a link-editing run for generating the LCP load module. For a conversion run by the LCP: One S/360 Model 40 with 128K core storage. The LCP itself needs a minimum of 70K bytes to operate in a PCP or MFT environment. The 70K bytes include the Data Management routines and buffers. To use the LCP with MVT, it is suggested that 6K be added to the SIZE chosen, so as to obtain the REGION specification. Also required- Standard Instruction Set...Decimal Arithmetic feature...Floating Point Arithmetic feature...minimal peripheral equipment required by the Operating System.

For creation of the LCP load module, an additional 2311 Disk Storage Drive or magnetic tape unit is required to run the distributed program. In order to create the LCP load module and/or execute a conversion run, the Operating System must include the modules for the PL/I (F) Compiler and its Library.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List...IBM System/360 Conversion Aids: FORTRAN IV-to-PL/I Language Conversion Program for IBM System/360 Operating System (C33-2002).
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Source modules.

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ORDERING INFORMATION: PROGRAM NUMBER 360CCV710

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		1316	52	01
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360C-CV-711
ALGOL TO PL/I (F) LANGUAGE CONVERSION PROGRAM

DESCRIPTION - The ALGOL-to-PL/I (F) Language Conversion Program (LCP) assists customers in the transition from OS/360 ALGOL-to-PL/I(F).

PROGRAMMING SYSTEMS - The LCP, intended for operation within the System/360 Operating System, is written in PL/I (F).

MINIMUM SYSTEM REQUIREMENTS - The machine requirements depend on the type of run to be made: a conversion run or a link-editing run for creating the LCP load module.

For a conversion run by the LCP: One S/360 Model 40 with 128K core storage. The LCP itself needs a minimum of 54K bytes to operate in a PCP or MFT environment. The 54K bytes include the Data Management routines and buffers. To use the LCP with MVT, it is suggested that 6K be added to the SIZE chosen so as to obtain the REGION specification. Also required - Standard Instruction Set...Decimal Arithmetic feature...Floating Point Arithmetic feature... minimal peripheral equipment required by the Operating System.

For creation of the LCP load module, an additional 2311 Disk Storage Drive or magnetic tape unit is required to run the distributed program. In order to create the LCP load module and/or execute a conversion run, the Operating System must include the modules for the PL/I (F) Compiler and its Library.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List...IBM System/360 Conversion Aids: ALGOL-to-PL/I Language Conversion Program for IBM System/360 Operating System (C33-2000).
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Program Material List.
MACHINE READABLE - Symbolic modules.

ORDERING INFORMATION: PROGRAM NUMBER 360CCV711

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		1316	52	01
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360C-CV-712 *M
COBOL (E/F)-to-PL/I (F) LANGUAGE CONVERSION PROGRAM

DESCRIPTION - The COBOL (E/F)-to-PL/I (F) Language Conversion Program (LCP) assists customers in the transition from OS/360 COBOL (E/F)-to-PL/I (F).

PROGRAMMING SYSTEMS - The LCP, intended for operation within the System/360 Operating System, is written in PL/I (F).

MINIMUM SYSTEM REQUIREMENTS - The machine requirements depend on the type of run to be made; a conversion run or a link-editing run for creating the LCP load module. For the conversion run by the LCP: S/360 Model 40 with 128K bytes of main storage. The LCP itself needs a minimum of 80K bytes to operate in a PCP or MFT environment. The 80K bytes include the Data Management routines and buffers. To use the LCP with MVT, it is suggested that 6K be added to the SIZE chosen so as to obtain the REGION specification. Also required - Standard Instruction Set...Decimal Arithmetic feature...Floating Point Arithmetic feature... minimal peripheral equipment required by the Operating System.

For creation of the LCP load module, an additional 2311 Disk Storage Drive or magnetic tape unit is required to run the distributed program. In order to create the LCP

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load module, and/or execute a conversion run, the Operating System must include the modules for the PL/I(F) Compiler and its Library.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List...IBM System/360 Conversion Aids: COBOL (E/F)-to-PL/I(F) Language Conversion Program (C33-2001).
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Program Material List... LCP Creation Procedure.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360CCV712

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
		1316	52	01
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none

360C-CV-713 *N
COBOL TO USA STANDARD COBOL ICP FOR OS/360

DESCRIPTION - Input to the Language Conversion Program (LCP) must be a COBOL E or F source program which-- adheres to the appropriate specifications.. compiles and executes correctly using the current compiler. The output from the LCP is a source listing and, at the user's option, a new translated source deck. The listing identifies all changes made to the original source program and flags those statements which must be verified or manually converted.

MINIMUM SYSTEM REQUIREMENTS - The LCP functicns on System/360 Model 30, 40, 50, 65, 67 (in 65 mode), 85, 91, or 195. It requires a minimum of 26K bytes of main storage. In addition to the features required for OS/360, the following features must be available... Commercial Instruction Set (Model 91, the decimal simulator)... Input Data Set (source program)... Listing Data Set... Three Utility Data Sets. One Utility Data Set must be a disk; the others may be tape or disk.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... System/360 Conversion Aids (C28-6400).
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List... LCP Creation Prccedure.
MACHINE READABLE - Source modules and sample control cards.

ORDERING INFORMATION: PROGRAM NUMBER 360CCV713

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

360C-EU-074
1401/1460 EMULATOR PROGRAM

DESCRIPTION - The 1401/1460 Emulator Program is a stand-alone program that executes 1401/1460 programs when the 1401/1460 Compatibility Feature (No. 4457). The compatibility feature, which executes 1401 instructions (excluding I/O and Edit instructions) at an average internal speed of approximately 4.5 times that of the 1401, and the emulator program together comprise the emulator. Currently operating, non time-dependent 1401/1460 programs can be executed without modification, although certain special and custcm features are not emulated. By eliminating the requirement to convert all 1401/1460 programs before installing System/360, the emulator allows the user to apply mcst of his programming resources towards developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the emulator also allows immediate productions runs upon installation, allows time for user education in System/360 concepts, and eases the pressure of program testing.

The basic 1401/1460 configuration being emulated may include

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six tape drives, five disk storage drives, punched card data processing equipment, and the 1407/1447 Console. The emulator makes the Model 40 appear to the 1401/1460 program as a 16K 1401/1460 with all basic features and the following optional features - Advanced Programming (No. 1060) Bit Test (No. 1470)... Column Binary(No. 1990)... Expanded Print-Edit (No. 3835)... High-Low-Equal Compare (No. 4575)... Multiply-Divide (No. 5275)... Print Storage (No. 5585)... Additional Print Control (No. 5540)... 51-Column Interchangeable Read Feed (No. 4150)... Processing Overlap (No. 5730)... Punch-Feed Read (No. 5890)... Read-Punch Release (No. 6040)... Space Suppression (No. 7246)... Sense Switches (No. 7600)... Binary Transfer (1460) (No. 1468)... Direct Seek (1311) (No. 3281) (No. 3282), (No. 3283)... Track-Record (1311) (No. 8011)... Indexing and Store Address Register (1460) (No. 4631).

MINIMUM SYSTEM REQUIREMENTS - For card/tape systems - 1401/1460 Compatibility feature (No. 4457) with EC No. 256221 or EC No. 256226... 32,768 bytes of main storage, minimum (Model E 40)... Decimal Arithmetic feature (No. 3237)... 1052 Printer-Keyboard and 2052 Adapter (No. 7020)... Initial Program Load Device; either 2540 Card Read/Punch, or 2400-Series Tape Unit, either 9-track or 7-track, or 2311 Disk Storage Drive.

If the Emulator Program is to be loaded from a 2400-Series Tape Unit equipped with the 7-track Read-Write Head (No. 9557), the 7-track compatibility feature (Nos. 7125, 7126, 7127), and the Data Conversion Feature (Nos. 3228 or 3236) must be installed on the associated tape control unit. After the Emulator Program has been loaded, the load device is available as a 1401/1460 corresponding device. (See below)

System Requirements for disk systems - all of the above plus, Disk Compatibility feature (No. 9710)... 65,536 bytes of main storage, minimum (Model F40).

Input/output device correspondence is as follows -

1401/1460 I/O device	System/360 I/O device*
1402 Card Read Punch, Model 1 or 3.	2540 Card Read Punch and 2821 Control Unit with 1400 Compatibility Feature No. 8065.
1403 Printer Model 1 2, or 3.	1403 Printer Model 2 or N1 or 1404 Printer, continuous forms mode only.
729 II, IV, V, or VI Tape Unit or 7330 Magnetic Tape Unit.	2401, 2402, 2403, or 2415 Tape Units Model 1, 2, 3, 4, 5, or 6; or 2404 Tape Unit, Model 1-3.
1407/1447 Console Inquiry Station.	1052 Printer-Keyboard, Model 7, with PTTC/EBCD Code Printing Element.
1311 Disk Storage Drive, Models 1, 2, or 4.	2311 Disk Storage Drive** Model 1.

*Magnetic Tape Units and Disk Storage Drives must be on selector channel 1 for emulation. All other units must be on the Multiplexor Channel.

**The 2311 Disk Storage Drive does not accept solid-hub 1316 Disk Packs.
Input/Output Feature Correspondence is as follows -

1401/1460 I/O features	System/360 I/O feature
1402 Punch-Feed Read and Control Unit, feature No. 5890 and No. 5895.	2540 Punch-Feed Read, feature No. 5890; Punch -Feed Read Control, feature No. 5895, on the 2821 Control Unit.
Column Binary feature No. 1990, Binary Transfer feature No. 1468.	Column Binary feature No. must be installed on the 2821 Control Unit.
1442 51-column Interchangeable Read-Feed and Feed Adapter, feature Nos. 4150 and 1013.	2540 51-column Read-Feed*, feature No. 4151
1403 Preferred Character Set and Adapter, feature Nos. 5523, 5524, 1416 Interchangeable Train Cartridge, equipped with Preferred Character Set Print Train.	1403 Universal Character Set feature No. 8641 for Model 2, No. 8640 for Model N1. with prerequisite inter-changeable train cartridge, and the Universal Character Set Adapter on the 2821 Control Unit.
1311 Scan Disk feature No. 6396.	2841 File Scan feature No. 4385.

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*This feature reduces the 2540 read speed from 1000 CPM to 800 CPM.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material list. Sample problem operating instructions; 1401/1460 Emulation Manual C28-6561.
MACHINE READABLE - Sample problem deck, Absolute Loader, object deck and Disk Loader object deck. For disk systems, a disk initialization program is required and must be ordered separately. A suitable initialization program is the Initialize Disk (2311) Program, 360P-UT-069.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU074

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 7DC/800	26	none
		DTR 9/1600	29	none
OPTIONAL		DTR 9/800	28	none
		DTR 7DC/800	26	none
		DTR 9/1600	29	none

360C-EU-097
TAPE OVERLAP EMULATOR PROGRAM FOR THE S/360 MODEL 30

DESCRIPTION - The Tape Overlap Emulator Program allows overlap of selector channel magnetic tape operations with processing of 1401/1440/1460 programs by a System/360 Model 30 equipped with the 1401/1440/1460 Compatibility feature. After receiving control via the Programmed Mode Switch feature, the Tape Overlap Emulator Program interprets the tape input, output, and control requirements of a 1400 program, initiates any required operation, then returns control to the 1400 program. A buffer transfer technique is employed for transfer of data between the Tape Overlap Emulator Program and the 1400 program, allowing tape operations to take place simultaneously with execution of the 1400 program by the compatibility feature.

FEATURES -
- Use of the input/output and external interruption facilities of System/360 to optimize channel use.
- Support of up to two selector channels.
- Support of up to six 2400-series Tape Units.
- Overlap of a single tape operation with 1400-series processing on single selector channel configurations.
- Use of either 7-track, 9-track, or a combination of 7-track and 9-track tapes.
- Use of an optional initialization feature.
- Processing of fixed or variable length blocked tape files in either move or load mode, and in either binary or BCD format.
- Use of a blocked tape option; for tape files containing fixed or variable length physical records, and integral multiple of the original block size can be specified as the blocking factor.

PERFORMANCE - The throughput improvement that can be expected when using the Tape Overlap Emulator Program varies with the ratio of tape input/output operations to processing operations in a 1400 program and with the data rate characteristics of the system. The amount of overlap achieved by the Tape Overlap Emulator Program diminishes considerably at data rates in excess of 60,000 bytes per second. Significant throughput improvements can be expected for 1400 programs which have a relatively large percentage of magnetic tape operations, and which use either two-selector channel configurations or single-channel configurations using the blocked tape option of the Tape Overlap Emulator Program. On single-channel configurations, the greatest throughput improvements can be expected for 1400 programs having a balance between tape input/output and processing requirements. A reduction in the amount of overlap and blocking possible, and thus less improvement in throughput, is to be expected for 1400 programs which read and/or write large tape records such as checkpoint records. If record size precludes use of the Tape Overlap Emulator Program buffers, the file containing that record must be defined as unblocked and the read or write for the long record will be nonoverlapped. The amount of overall degradation in throughput depends upon how often the unblocked files must be accessed.

MINIMUM SYSTEM REQUIREMENTS - Those required to support the Tape Overlap Emulator Program also supports a 1400-series program using up to 8,000 bytes of compatibility storage and additional main storage of up to 2,001 bytes that is used for the combination of Tape Overlap Emulator Program input/output buffer areas and other user-provided subroutines.

- A System/360 Model 30 with a 2030 Processing Unit Model

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D30 (16,384 bytes of main storage).
- An on-line card reader (necessary for reading control cards and user subroutines).
- An on-line printer (required for initial control control cards and user subroutines).
- One selector channel with single channel tape control.
- Up to a maximum of six 2400-Series Tape Units - 2401, 2402, 2403, and 2415 Magnetic Tape Units and Control Models 1-6. Model 6 of 2401, 2402, and 2403 tape units can be used in System/360 (2030) mode operations; they cannot be used in compatibility mode operations. If 7-track tapes are used they must be equipped with the 7-track Compatibility feature and 7-track read/write heads. One 2400-Series Tape Unit must be assigned for each 729 or 7330 Tape Unit being emulated.
- The 1401/1440/1460 Basic Compatibility feature for the System/360 Model 30 (No. 4456).
- The Programmed Mode Switch feature for the System/360 Model 30 (No. 5856).
- The Magnetic Tape Compatibility feature for the System/360 Model 30 (No. 4468).
- Any additional compatibility features and associated input/output devices required by the 1400-series programs to be executed.

In addition to the minimum configurations shown above, the following components may also be used in conjunction with the Tape Overlap Emulator Program -

- System/360 Model 30, with 2030 Processing Unit Models E30 and F30 for operations requiring additional main storage. Programs which do not fall within the restrictions indicated in the first paragraph of the configuration requirements section will require at least a System/360 Model E30 (32K).
- Additional selector channel with single-channel tape control.
- Two selector channels with a 2404/2804 (Read-While-Write Shared Tape Control Units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Specifications and Operating Guide, C26-3564, Sample Problems Manual, C27-6929.
MACHINE READABLE - Object deck, Loader deck, Emulator Disk Loader and sample protlem.

OPTICNAL PROGRAM PACKAGE
DOCUMENTATION - Source Assembly Instructions, Material List.
MACHINE READABLE - Emulator Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU097

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
CPTICNAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360C-EU-725
7074 EMULATOR PROGRAM

DESCRIPTION - The 7074 Emulator Program is a stand-alone program that executes 7074 and 7070 programs that are 7074 compatible, when used on System/360 Models 50 and 65 equipped with 7070/7074 Compatibility feature (No. 7117). The Emulator Program and the Compatibility feature together constitute the emulator. Currently operating non time-dependent 7070/7074 programs can be executed without modification, although certain special and custom features are not emulated. By eliminating the requirement to convert all 7070/7074 programs before installing System/360, the Emulator allows the user to apply most of his programming resources toward developing new applications to take full advantage of System/360 facilities. Use of the emulator also eases the pressure cf program testing.

Internal performance of the Emulator with respect to the 7074 ranges from .5 times 7074 CPU speed (System/360 Model 50) to 1.8 times 7074 CPU speed (System/360 Model 65). Internal performance with respect to the 7070 ranges from 2.4 times CPU speed (System/360 Model 50) to 8.4 times 7070 CPU speed (System/360 Model 65). Timing information which may be used to estimate throughput is presented in the SRL publication, System/360 conversion aids - the 7074 Emulator Program for System/360 Models 50 and 65, (C27-6908). The basic 7070/7074 configuration being emulated may include 10 tape units on each of four channels on System/360 Model 65 or three channels on System/360 Model 50, unit record equipment, and the 7150 Console Typewriter.

MINIMUM SYSTEM REQUIREMENTS - In addition to the 7074 Compatibility Feature, System/360 requirements are: 262,144 bytes of main storage (Model H)...One 1052 Printer-Keyboard...One selector channel for each tape channel of the system being emulated...One 2401 or 2402 Magnetic Tape

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Unit, Models 1-6; 2403 or 2415 Magnetic Tape Unit and Control, Models 1-6; or one 2404 Magnetic Tape Unit and Control Models 1-3; or one 2420-7 (Model 65 only) and control for each 729 Tape Unit to be emulated; or one 2420-5 and control for each 729 Tape Unit to be emulated. The 2415 Magnetic Tape Unit and Control is nct supported with System/360 Model 65.

If the Emulator Program is to be loaded from a magnetic tape unit equipped with the Seven-Track Read Write Head (9557) and the Seven-Track Compatibility Feature (7125, 7127), the Data Conversion feature (3228 or 3236) must be installed on the associated tape control unit. After the Emulator Program has been loaded, the load device is available as a 7074 corresponding device. (See table.)

Input/Output Device Correspondence is as follows -

I/O Device Correspondence Table for 7074 Emulator

7070/70774 Device	System/360 Device
7500 Card Reader	1442 Card Read Punch or
7501 Console Card Reader	2501 Card Reader or 2520 Card Read Punch or 2540 Card Read Punch
7550 Card Punch	1442 Card Read Punch or 2520 Card Read Punch or 2540 Card Read Punch
7400 Printer	1443 Printer or 1403 Printer
7150 Console Typewriter	1052 Printer-Keyboard
729 Series Magnetic Tape Units	2401 or 2402 Magnetic Tape Units, Models 1-6, 2403 or 2415* Magnetic Tape Unit and Control, Models 1-6 or 2402 Magnetic Tape Unit and Control Models 1-3 or 2420-5 and 7 Magnetic Tape Unit** or 2420-5 Magnetic Tape Unit***

* 2415 on Model 50 only
** 2420-7 on Model 65 only
*** 2420-5 on Model 50

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... Sample Problem Operating Instructions... Conversion Aids Manual, C27-6908.
MACHINE READABLE - Sample problem and the 7074 Emulator Program (object code).

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Program Material List.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU725

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01

360C-EU-726
MODEL 50 1410/7010 EMULATOR

DESCRIPTION - The 1710/7010 Emulator program is a stand-alone program which, with the 1410/7010 Compatibility feature (No. 4478), executes 1410/7010 programs on a System/360 Model 50. The Emulator program is an interpreter simulator that uses both standard System/360 instructions and special instructions provided by the Compatibility feature. Combined, the Emulator program and the Compatibility feature are referred to as an Emulator. Currently operating non-time-dependent 1410/7010 programs can be executed by the Emulator without modification, although certain special and custom features are not emulated. By eliminating the requirement to convert all 1410/7010 programs before installing System/360, the Emulator allows the user to apply most of his programming

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resources towards developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Emulator also allows immediate production runs upon installation, allows time for user education in System/360 concepts, and eases the pressure of program testing.

The average internal speed of the Emulator (excluding I/O and edit instructions) is approximately 3 times that of the 1410. Throughput performance depends on the mixture of instructions and the comparative performance of I/O devices. With equivalent I/C devices, throughput for most jobs which are not I/O bound will be approximately that of the 7010 system or up to 2 times 1410 system throughput; I/O bound jobs will run at approximately the same speed as on the emulated system. Timing information which may be used to estimate throughput is presented in the SRL publication, System/360 Conversion Aids - The 1410/7010 Emulator Program for System/360 Model 50, C28-6568.

MINIMUM SYSTEM REQUIREMENTS - The specified performance can be attained for disk systems only if EC413140 is installed on 2841 Storage Control Units. Throughput with lower level 2841's may be reduced by as much as two-thirds. The basic 1410/7010 configuration being emulated may include ten disk modules on each of three channels, ten tape units on each of three channels, unit record equipment on channel 1, and the 1415 Console Printer. The Emulator appears to the 1410/7010 program as a 1410/7010 of any standard memory size with the following features - 1410/7010 processing overlap and priority processing... 1410 Dual Synchronizer Adapter... 7010 second and third channels and Store and Restore Status instructions. In addition to the 1410/7010 Compatibility feature (No. 4478), the System/360 requirements are -

- Model 50F for up to 40,000 positions of 1410/7010 core storage, or
- Model 50G or larger for up to 100,000 positions of 1410/7010 core storage.
- One 1052 Printer-Keyboard, Model 7, and 1052 Adapter (No. 7920).
- One program-load device which may be any of the following -
 - 2540 Card Read Punch.
 - 1442 N1 Card Read Punch.
 - 2501 B1 or B2 Card Reader.
 - 2520 B1 Card Read Punch.
 - 2400-series Magnetic Tape Unit.
 - 2302 Disk Storage.
 - 2311 Disk Storage Drive.

Loading of the Emulator Program, as distributed by PID, must be from card or tape. Subsequent loading can be from card, tape, or disk. If the Emulator program is to be loaded from a magnetic tape unit equipped with the 7-track Read-Write Head (No. 9557), the 7-track Compatibility feature (Nos. 7125, 7126, 7127), and the Data Conversion feature (No. 3228 or No. 3236) must be installed on the associated tape control unit. After the Emulator program has been loaded, the load device, except for the 2311, is available as a 1410/7010 corresponding device. (see below)

Input/output unit correspondence is as follows -

1410/7010 I/O UNITS	Equivalent System/360 MODEL 50 I/O UNITS
1402 Card Read Punch Model 2*	2540 Card Read Punch.
1442 Card Reader, Model 3*	1442 Card Read Punch, Model N1. 2501 Card Reader, Model B1 or B2. 2520 Card Read Punch, Model B1.
1403 Printer, Model 1, 2, or 3*	1403 Printer, Model 2 or N1. 1404 Printer, Model 2.
729 II, IV, V, and VI Magnetic Tape Units	2401, 2402, 2403, or 2415 Magnetic Tape Units, Models 1, 2, 3, 4, 5, or 6, or 2404 Tape Units, Models 1, 2, or 3; 7- or 9-track.
7330 Magnetic Tape Unit	same as for the 729 Magnetic Tape Units.
1415 Console Printer	1052 Printer-Keyboard, Model 7 with printing element No. 9572.
1301 Disk Storage Model 1, 2 and 3	2314 Disk Storage Model 1
2302 Disk Storage Model 1 and 2	2314 Disk Storage Model 1

Model correspondence as follows -

Two Model 1	one Model 3
One Model 2	one Model 3
Four Model 1	one Model 4
Two Model 2	one Model 4
Two Model 1 and one Model 2	one Model 4

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*Emulated punched card data processing equipment must previously have been assigned to 1410/7010 channel 1. Input/output feature correspondence is as follows -

1410/7010 FEATURE	MODEL 50 FEATURE
1402 51-Column Interchangeable Read Feed, feature Nos. 1013, 4150.	2540 51-Column Interchangeable Read Feed, feature No. 4151.

BASIC PROGRAM PACKAGE -
DOCUMENTATION - Program Material List... Sample problem operating instructions... Operating Guide, C28-6557... Emulation Manual, C28-6568.
MACHINE READABLE - Absolute loader, emulator object deck, sample problem and disk loader.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU726

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 7/DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360C-EU-727
7080 EMULATOR PROGRAM

DESCRIPTION - The 7080 Emulator Program is a stand-alone program that, with the 7080 Compatibility feature (No. 7118), executes currently-operating 7080 programs on a System/360 Model 65. The combination of Emulator program and Compatibility feature is referred to as an Emulator. Programs for 705 I/II and 705 III can also be run by the Emulator, if they are compatible with the 7080. This usually requires running these programs in conjunction with INT580; however, 705 III programs that can be run without modification on the 7080 will run on the emulator. By eliminating the requirement to convert all 7080 programs before installing the System/360, the Emulator allows the user to apply most of his programming resources toward developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Emulator also eases the pressure of program testing.

The average internal speed of the Emulator on System/360 Model 65 is equal to that of the 7080. Timing information is presented in the SRL publication, System/360 Conversion Aids - The 7080 Emulator Program for System/360 Model 65, C27-6911. The 7080 configuration being emulated may include 10 tape units on each of four communication channels, a 7153 Console, and a 7502 Console Reader.

MINIMUM SYSTEM REQUIREMENTS - In addition to the Compatibility feature, System/360 requirements are at least 262,144 bytes of main storage (Model H) for the emulation of a 7080 with 80,000 characters of memory. 524,288 bytes of main storage (Model I) is the minimum requirement to emulate a 7080 with a 160,000 character memory... one 1052 Printer-Keyboard... one selector channel for each communication channel of the 7080 being emulated... one 2401, 2402, or 2403 Magnetic Tape Unit (Model 1-6), or one 2404 Magnetic Tape Unit, (Model 1-3), or one 2420 Magnetic Tape Unit Model 5 or 7 for each 729 Tape Unit to be emulated. If the Emulator program is to be loaded from a magnetic tape unit equipped with the 7-track Read Write Head (No. 9557) and the 7-track Compatibility feature (Nos. 7125, 7126, or 7127), the Data Conversion feature (No. 3228 or No. 3236) must be installed on the associated tape control unit. After the program has been loaded, the load device is available as 7080 corresponding device (see below).

Input/output device correspondence is as follows -

I/O Device Correspondence Table for 7080 Emulator

7080 DEVICE	SYSTEM/360 DEVICE
7153 Console	1052 Printer-Keyboard
7502 Console Card Reader	1442 N1Card Read Punch 2501 B1 Card Reader 2501 B2 Card Reader 2520 B1 Card Read Punch

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	2540 Card Read Punch
729 Series Magnetic Tape Units	2401, 2402, or 2403 Magnetic Tape Units, Model 1-6, or 2404 Magnetic Tape Units, Model 1-3. or 2420 Magnetic Tape Unit Model 5 or 7.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... Sample Problem Operating Instructions... Conversion Aids Manual, C27-6911... Sample Problems for IBM System/360 Emulator Programs, C27-6929.
MACHINE READABLE - Emulator program and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Emulator source program.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU727

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7/DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360C-EU-728
S/360 MOD 40 1410/7010 EMULATOR PROGRAM

DESCRIPTION - This is a stand-alone program that executes 1410/7010 programs when used on a System/360 Model 40 equipped with the 1410/7010 Compatibility feature (No. 4478). The Emulator program uses both standard S/360 instructions and special instructions provided by the Compatibility feature. The Emulator consists of the Compatibility feature and the Emulator program. Currently operating non time-dependent 1410/7010 programs can be executed without modification, although certain special and custom features are not emulated.

By eliminating the requirement to convert all the users 1410/7010 programs before installing the System/360, the Emulator allows the user to apply most of his programming resources towards developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Emulator also allows immediate production runs upon installation, allows time for user education in System/360 concepts, and eases the pressure of program testing. The average internal speed of the Emulator excluding I/O instructions (except Move Characters and Edit, and Move Characters and Suppress Zeros) is approximately twice that of the 1410. Throughput performance depends on the mixture of instructions and the comparative performance of I/O devices. However, throughput time for most jobs will be equal to or better than the throughput time on 1410 systems. Timing information which may be used to estimate throughput is presented in the SRL publication, IBM System/360, Model 40, Emulation of the IBM 1410/7010 Data Processing Systems, C28-6563.

The basic 1410/7010 configuration being emulated can include ten disk modules on each of two channels, ten tape units on each of two channels, punched card data processing on channel 1, and the 1415 Console Printer. The Emulator makes the Model 40 appear to the 1410/7010 program as a 40K or 80K 1410/7010 with the following features - 1410/7010 Processing Overlap... 1410/7010 Priority... 1410 Dual Synchronizer Adapter... 7010 Second Data Channel... 7010 Store and Restore Status instructions.

MINIMUM SYSTEM REQUIREMENTS - In addition to the 1410/7010 Compatibility feature (No. 4478) the S/360 requirements are - Model 40F for a 40K 1410/7010, or Model 40G or larger for an 80K 1410/7010... Decimal Arithmetic Feature (No. 3237)... one 1052 - Model 7, and 1052 Adapter (No. 7920)... Program-Load Unit - any of the following - 2540 Card Read Punch. 1442 N1 Card Read Punch, 2501 B1 or B2 Card Reader, 2520 B1 Card Read Punch, 2400 Series Magnetic Tape Unit, 2302 Disk Storage, 2311 Disk Storage Drive. If the Emulator Program is to be loaded from a magnetic tape unit equipped with the 7-track Read/Write Head (No. 9557) and the 7-track Compatibility feature (No. 7125, 7126, 7127), the Data Conversion feature (No. 3228 or 3236) must be installed on the associated tape control unit. After the Emulator program has been loaded, the load device, except for the 3211, is available as a 1410/7010 corresponding device.

Input/output device correspondence is as follows -

Equivalent System/360, Model 40	1410/7010 I/O DEVICES	INPUT/OUTPUT DEVICES
	IBM1402 Card Read Punch, Model 2*	IBM 2540 Card Read Punch
	IBM 1442 Card Reader, Model 3*	IBM 1442 Card Read Punch, Model N1 IBM 2501 Card Reader, Model B1 or B2 IBM 2520 Card Read Punch, Model B1
	IBM 1403 Printer, Model 1, 2, or 3*	IBM 1403 Printer, Model 2 or N1 IBM 1404 Printer, Model 2.
	IBM 729 II, IV, V and VI Magnetic Tape Units	IBM 2401, 2402, 2403, or 2415 Magnetic Tape Units, Model 1, 2, 3, 4, 5, or 6** or 2404 Tape Units, Models 1, 2, or 3, 7- or 9-track.
	IBM 7330 Magnetic Tape Units	Same as for the IBM 729 Magnetic Tape Units
	IBM 1415 Console Printer*	IBM 1052 Printer Keyboard, Model 7 with printing element No. 9572.
	IBM 1301 Disk Storage	IBM 2302 Disk Storage

Model correspondence as follows -

two Model 1	one Model 3
one Model 2	one Model 3
four Model 1	one Model 4
two Model 2	one Model 4
two Model 1 and one mdl 2	one Model 4

* Emulated unit record equipment must previously have been assigned to 1410/7010 channel 1.
** 2401/2402/2403 Model 6's may be used on either selector channel 1 or 2, but not both simultaneously.

Input/output feature correspondence is as follows -

1410/7010 FEATURE	MODEL 40 FEATURE
IBM 1402 51-column Interchangeable Read Feed, Feature Codes 1013, 4150	IBM 2540 51-column Interchangeable Read Feed, Feature Code 4151

BASIC PROGRAM MATERIAL
DOCUMENTATION - Program Material List... Operating Instructions for Sample Programs, C27-6929... 1410/7010 Emulator Manual, C28-6563... Emulator restrictions.
MACHINE READABLE - The absolute loader, Emulator object deck, sample problem and disk loader are available.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU728

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360C-EU-729 *M
MODEL 65 EMULATOR PROGRAM FOR 709/7090/7094

DESCRIPTION - The 709/7090/7094/7094II Emulator Program is a stand-alone program that executes 7090 series programs on a 512K System/360 Model 65 equipped with the 7090 Compatibility feature (No. 7119). The Emulator program uses standard System/360 instructions and the special instructions provided by the Compatibility feature. The Compatibility feature is the hardware that is added to a System/360 Model 65 to permit the execution of 7090 series programs. The Emulator program and the Compatibility feature combined are known as the Emulator. The Emulator provides an efficient means of converting to System/360 by eliminating the necessity of converting all 7090 series programs before installing System/360. The Emulator allows the user to better allocate his programming resources toward developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Most currently operating, non-time-dependent, 7090 series programs can be executed without modification, although certain special and custom features are not emulated. The performance of the Emulator will vary

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according to the instructions used and the I/O activity of the emulated 7090 series program. A study of instruction distributions obtained from sample runs on a 7090 indicates that the average internal speed of the Emulator, when executing non-I/O instructions, is approximately twice that of the 7090. Throughput performance is, of course, highly dependent upont the mixture of instructions and the comparative performance of equivalent I/O devices used in a given application. However, experience to date indicates throughput time for most jobs will be approximately equal to the job time on the 7094 Model 1. Timing information that may be used to estimate throughput is presented in the publication, System/360 Conversion Aids - The 709/7090/7094/7094II Emulator Program for the System/360 Model 65, C28-6565.

MINIMUM SYSTEM REQUIREMENTS - The basic machine requirement for using the Emulator is a System/360 Model 65 equipped with - at least 524288 bytes of main storage... the 7090 Compatibility feature... a 1052 Model Printer-Keyboard with 1052 Adapter (No.7920) or with 2150 Console... a 2400 series Magnetic Tape Unit (9-track or 7-track with the Data Conversion feature)... two additional 2400 series Magnetic Tape Units (or one 2400 unit and one of the following- 2501 Card Reader, 1442 Card Read Punch, 2520 Card Read Punch, or 2540 Card Read Punch) for initialization purposes. However, card read-punch facilities must be available either on-or-off line. If a 7-track 2400 series Magnetic Tape Unit is used to contain the Edit file, the tape control unit must be equipped with the Data Conversion feature. A variety of S/360 Input/output devices may be used to emulate the 7090 series devices.

There are certain requirements for the System/360 devices. All card read punch units must be equipped with the Card Image feature and all tape drives used for 7-track tapes must be equipped with the 7-track Compatibility feature. In addition one or more 2860 channels or 2870 channels are recommended for each 7090 channel emulated. As assembled and distributed the Emulator supports 7090 channels A through D. Tapes on the 2870 Multiplexer Channel must be connected through selector subchannels. The maximum combined rate for tapes attached to the multiplexer channel is 360 KC. All emulated 7090 unit-record devices must have the same 7090 channel address (normally, this is channel A). This requirement does not, however, preclude using separate S/360 channels for the emulation of these devices.

Below shows the System/360 devices that may be used to emulate 7090 series devices.

7090-SERIES DEVICES	SYSTEM/360 DEVICES
729 Tape Unit	2400-series Magnetic Tape Unit**
711 Card Reader	2540 Card Read Punch 1442 Card Read Punch* 2501 Card Reader 2520 Card Read Punch* 2400-Series Magnetic Tape Unit**
716 Printer	1052 Printer-Keyboard 1403 Printer 1443 Printer 2400-Series Magnetic Tape Unit**
721 Card Punch	2540 Card Read Punch 1442 Card Read Punch* 1442 Card Punch 2520 Card Read Punch* 2520 Card Punch 2400-Series Magnetic Tape Unit**

* The 1442 and the 2520 can be used to emulate either the 711 or the 732, but not both at the same time.
** 2415 Magnetic Tape Unit is not supported.

Input/output devices are required for Emulator Program residence, control-information input, message output and console functions. Below shows S/360 devices that may be used for each of the above mentioned functions.

EMULATOR FUNCTION	SYSTEM/360 DEVICE
Emulator Program Residence	2400-series Magnetic Tape Unit*
Control-Information Input	1052 Printer-Keyboard 2400-series Magnetic Tape Unit* 2540 Card Read Punch 1442 Card Read Punch 2501 Card Reader 2520 Card Read Punch
Message Output	1052 Printer-Keyboard 1403 Printer 1443 Printer 2400-series Magnetic Tape Unit*

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Console Functions	1052 Printer-Keyboard

* If 7-track, the Data Conversion feature is required.

The indicated devices neet not be in addition to the devices shown above. Also, the 1052 may concurrently perform more than one Emulator function.

BASIC PROGRAM MATERIAL
DOCUMENTATION - Program Material List... Sample Problem Manual, C27-6929... Conversion Aids Manual, C28-6565.
MACHINE READABLE - Initialization deck... The object program and the sample problem are available.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List, Assembly operating instructions and Source Tape Directory.
MACHINE READABLE - Emulator source program.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU729

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360C-EU-731
1620 EMULATOR PROGRAM

DESCRIPTION - This is a stand-alone program that provides compatibility with 1620 input/output operations and works in conjunction with the 1620 Compatibility feature (No. 7190) to provide 1620 system compatibility. The 1620 Compatibility feature and the Emulator program together comprise the System/360 Model 30 1620 Emulator. The 1620 Emulator, using the facilities of the 2030 and associated I/O devices, expedites the transfer of 1620 applications to the System/360 Model 30. This allows programming effort to be directed toward developing new applications for System/360 rather than immediate conversion of existing 1620 programs.

MINIMUM SYSTEM REQUIREMENTS - The following System/360 Model 30 facilities are required to emulate the 1620 -

1620	SYSTEM/360 MODEL 30
Storage	
20,000 characters	16,384 bytes (2030D)
40,000 characters	32,768 bytes (2030E)
60,000 characters	65,536 bytes (2030F)
Console Typewriter	1052 Printer-Keyboard with 1051 Control Unit
1621 Models 1, 2 (read functionally) Paper Tape 1622 Read Punch	2671 Paper Tape Reader with 2822 Control Unit 2540 Card Read Punch with 2821 Control Unit 1442-N1 Card Read Punch 1442-N2 Card Punch 2501 B1, B2 Card Reader 2520 B1 Card Read Punch 2520 B2, B3 Card Punch

Note - Separate paths for card reading and card punching must be provided.

1311 Disk Storage Drive	2311 Disk Storage Drive with 2841 Control Unit
1443 Printer	1443-N1 Printer 1403-2, 3, 7, N1 Printer with 2821 Control Unit

These I/O devices can be attached to any System/360 Model 30 channel. Every System/360 Model 30 with the 1620 Compatibility feature must have a 1052/1051 and card reader.

The 1620 Compatibility feature includes the following 1620 functions and features - all standard 1620 operations and instructions... additional instructions (Transfer Numeric Strip, Transfer Numeric Fill, More Flag) (1620-1)... automatic divide (1620-1)... Automatic Floating Point operations... binary capabilities (1620-2)... index registers (1620-2)... Indirect Addressing (1620-1).

The internal performance of the 1620 Emulator should be at least equal to that of a 1620 Model 2. Input/output operations are dependent on the speeds of the I/O devices. With devices the equivalent of those on the 1620,

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input/output operations will take approximately the same time.

BASIC PROGRAM MATERIAL
DOCUMENTATION - Program material list... Sample problem operating instructions... 1620 Compatibility Feature Manual, A24-3365.
MACHINE READABLE - The following materail is available in object card form - Initialization and I/O Control ... Disk Format 1... Disk Format 2... Absolute loader... Sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU731

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 7DC/800	26	none
		DTR 9/800	28	none

360C-EU-733 *N
7040/7044 EMULATOR PROGRAM

DESCRIPTION - The 7040 Series Emulator Program is a stand alone program that executes 7040 series programs on a System/360 Model 65 equipped with the Compatibility feature (No. 7119). The Emulator program uses standard System/360 instructions and the special instructions provided by the Compatibility feature. The Compatibility feature is the feature that is added to a System/360 Model 65 to permit the execution of 7040 series programs. The Emulator program and the Compatibility feature combined are known as the Emulator.

The Emulator provides an efficient means of converting to System/360 by eliminating the necessity of converting all 7040 series programs before installing System/360. The Emulator allows the user to apply most of his programming resources toward developing new applications and redesigning existing applications to take full advantage of System/360 facilities. A 32K 7040/7044 system with Basic Instruction Set, Extended Performance Set, Single-Precision Floating-Point, Double-Precision Floating-Point, and input/output instructions is emulated. Storage Protection and the Interval Timer are optionally supported. Most currently operating, non-time-dependent, 7040 series programs can be executed without modification, although certain special and customer features are not emulated.

The performance of the Emulator will vary according to the instructions used and the I/O activity of the emulated 7040 series program. The average internal speed of the Emulator, when executing non-I/O instructions, is approximately 1.4 times that of the 7044.

Throughput performance depends on the mixture of instructions and the comparative performance of equivalent I/O devices. However, throughput time for most jobs will be approximately equal to the throughput time on the 7044. Timing information that may be used to estimate throughput is presented in the publication, System/360 Conversion Aids - The 7040/7044 Emulator Program for the System/360 Model 65, C28-6585.

MINIMUM SYSTEM REQUIREMENTS - The basic machine requirement for using the Emulator is a System/360 Model 65 equipped with -

- At least 524,288 bytes of main storage.
- The 7040 Compatibility feature (No. 7119).
- A 1052 Printer-Keyboard Model 7 with 1052 Adapter (No. 7920) or with 2150 Console.
- A 2400 Series Magnetic Tape Unit (9-track, or 7-track with the Data Conversion feature).
- Two additional units for initialization purposes from the following - 2400 Series Magnetic Tape Unit, 1442 Card Read Punch, 2501 Card Reader, 2520 Card Read Punch or 2540 Card Read Punch. However, card read punch facilities must be available either on or off-line. If a 7-track 2400 Series Magnetic Tape Unit is used to contain the edit file, the unit must be equipped with the Data Conversion feature.

A variety of System/360 input/output devices may be used to emulate the 7040 series devices if the System/360 devices satisfy certain requirements. System/360 card read-punch units must be equipped with the Card Image feature if the equivalent 7040 device has the Column Binary feature. All tape drives used for 7-track tapes must be equipped with the 7-track Compatibility feature.

As assembled and distributed, the Emulator supports 7040 channels A through E. Tapes on the 2870 Multiplexer Channel must be connected through selector subchannels. The maximum

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combined rate for tapes attached to the multiplexer channel is 360 KB. Below shows the S/360 devices that may be used to emulate 7040-series devices.

7040 UNITS	SYSTEM/360 UNITS
729 Tape Unit 7330 Tape Unit	2400 Series Tape Unit***
1402 Card Reader	2540 Card Read Punch 1442 Card Read Punch* 2501 Card Reader 2520 Card Read Punch*
1403 Printer Console Typewriter	1052 Printer-Keyboard** 1403 Printer** 1443 Printer**
1402 Card Punch	2540 Card Read Punch 1442 Card Read Punch*
1622 Card Punch	1442 Card Punch 2520 Card Read Punch* 2520 Card Punch 1442 Card Read Punch*

* The 1442 and the 2520 can be used to emulate either the 1402 Reader or Punch, but not both at the same time.
** The 1052, 1403 and the 1443 can be used to emulate the printer or the typewriter, but not both at the same time.
*** 2415 Magnetic Tape Unit and control is not supported.

This emulator now includes support for 2420 Magnetic Tape Units Model 5 and 7 and 2803 Tape Control Unit Model 2.

Input/output devices are required for emulator-program residence, control-information input, message output, and console functions. Following the System/360 units that may be used for each of the above-mentioned functions.

EMULATOR FUNCTION	UNITS
Emulator-Program Residence	2400 Series Tape Units*
Control-Information Input	1052 Printer-Keyboard 2400 Series Tape Unit* 2540 Card Read Punch 1442 Card Read Punch 2501 Card Reader 2520 Card Read Punch
Message Output	1052 Printer-Keyboard 1403 Printer 1443 Printer 2400 Series Tape Unit
Console Functions	1052 Printer-Keyboard

* If 7-track, the Data Conversion feature is required.

Note - These units need not be in addition to the units previously mentioned above. Also, the 1052 may concurrently perform more than one emulator function.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... 7040/7044 Emulator Program for the System/360 Model 65, C28-6585... Sample Problems Manual, C27-6929.
MACHINE READABLE - Emulator object program, initialization object program.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU733

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360C-EU-734 *N
7094 INTEGRATED EMULATOR FOR THE SYSTEM/360 MODEL 85 UNDER OS/360

DESCRIPTION - The integrated emulator executes as a problem program under the System/360 Operating System, MFT or MVT version, in conjunction with the 7094 Compatibility Feature (7119). This combination of programming support and machine feature enables the System/360 Model 85 to execute programs

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written for the 709, 7090, 7094, and 7094II Data Processing Systems.

Job initiation, scheduling, and resource allocation are accomplished by OS/360 services. Input/output activity is controlled through the operating system I/O Supervisor. The operating system job control language is used for entering control information relative to devices and data sets. Additional emulator control commands provide direct communication with the emulator program.

The integrated emulator is available independently of OS/360 and is applied to an existing operating system which has been SYSGENed with appropriate space and facilities as detailed in the SRL for the emulator program.

MINIMUM SYSTEM REQUIREMENTS - The Emulator requirements are available in Operating System/360 Release 18.6. The 7094 devices are emulated on a one-for-one basis by corresponding System/360 input/output devices or direct access data sets. Minimum partition/region size for emulation is approximately 374K bytes of storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Basic Program Material List with attachment; IBM System/360 Operating System Emulator Program to emulate the IBM 709, 7090, 7094, 7094 II on the System/360 Model 85.
MACHINE READABLE - Load modules, emulator generation macro definition and sample program. Those who desire the 2311 package must specify Program Number Extension "2311". Those who desire the 2314 package must specify Program Number Extension "2314".

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Source statements and macros.

ORDERING INFORMATION: PROGRAM NUMBER 360CEU734

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	2311	MT	9/800	28	01
		MT	9/1600	29	01
	2314	MT	9/800	28	01
		MT	9/1600	29	01
OPTIONAL	none	MT	9/800	28	01
		DTR	9/1600	29	none

360C-FO-702
FORTRAN II LANGUAGE CONVERSION PROGRAM

DESCRIPTION - The FORTRAN II Language Conversion Program aids in the transition to System/360 by converting acceptable current FORTRAN II source programs into FORTRAN IV source programs for the System/360. The FORTRAN II LCP accepts as input -
1401 FORTRAN,
1410 FORTRAN II,
1620 FORTRAN,
1620 FORTRAN II,
1620 FORTRAN with Format,
1620 Monitor I FORTRAN II-D,
1620 Monitor II FORTRAN II-D,
1620 FORTRAN II for Automatic Floating Point,
7070 Series FORTRAN (Basic and Full),
7070 FOS FORTRAN,
0705 FORTRAN,
7080 Processor FORTRAN
7090/7094 FORTRAN II

The source programs can be converted to any of the following levels of System/360 FORTRAN -

Operating System/360 FORTRAN IV (level H),
Operating System/360 FORTRAN IV (E Level subset) and System/360 Basic Programming Support FORTRAN IV (Tape)
System/360 Basic Programming Support FORTRAN IV (Card)
Basic Operating System/360 with DOS/360
Basic Operating System/360 with TOS/360

FEATURES - The FORTRAN LCP has -

- Card or Tape Input - Both the LCP and the FORTRAN II source programs can be read from either cards or tape.
- Single or Stacked Program Conversion - A single source program can be processed from one of the three tape units needed in a minimum configuration. Stacked programs can be processed if more than three tape units are used.
- Card-Code Conversion for Dual BCK Characters - A control card option provides automatic conversion from BCD input code to EDCDIC output code, or vice versa. In this way, the LCP can convert the dual BCD characters, i.e., two characters with the same card code, into the proper System/360 card codes. The dual characters are - plus and ampersand... equal sign and pound sign... apostrophe and the commercial AT sign... left parenthesis and percent sign... right parenthesis and the lozenge.

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- Documented Listing - The LCP provides a listing of the converted program. This listing contains message codes and tables that document conversion actions and facilitate analysis of the converted program.
- Optional Card Output - When specified, the LCP produces a punched-card deck that contains the converted program.
- Optional Output on Tape - The user can specify that printed and/or punched output are to be recorded on tape.
- Replacement of Tape Refer - The user can specify that tape constants in Input/Output statements are to be replaced by a variable name or another tape constant.
- Resolution of COMMON-Equivalence Interaction - The user can specify that variables in COMMON statements are to be reordered so that a System/360 compiler will allocate COMMON storage and establish equivalencies in the same manner as the current FORTRAN II Compiler.

The FORTRAN II LCP will reduce the amount of reprogramming necessary to convert current FORTRAN II programs into System/360 FORTRAN IV programs. Use of the LCP will reduce time and money spent on recoding, clerical activities, and program debugging. Although the savings to be realized for a single program may be as great as 65 percent, the overall savings to a customer must be determined on an individual basis.

PROGRAMMING SYSTEMS - Written in 1401 FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - An 8K 1401 System with... a 1402 Card Read Punch... a 1403 Printer Model 2... Three tape units... the Advanced Programming feature... the High-Low-Equal Compare feature (or an IBM System/360 with 1401 Compatibility and corresponding features and I/O devices).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... FORTRAN II Language Conversion Manual.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - LCP source code.

ORDERING INFORMATION: PROGRAM NUMBER 1401FO702

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	7/556	22	none
		DTR	7/800	24	none
OPTIONAL	none	MT	7/556	22	01
		MT	7/800	24	01

360C-RG-700
IBM 1400 RPG TO SYSTEM/360

DESCRIPTION - This program operates on a 1401 or 1460 Data Processing System. The program is placed in this section of the System/360 Catalog to assist you in converting your data processing installation. The translator converts source programs written for any of the processors listed below to similar source programs acceptable to System/360 Model 20 RPG, System/360 Basic Programming Support ROG, Basic Operating System/360 RPG, or Operating System/360 RPG. 1400 RPG processors to be translated include -

1. 1401 RPG (2K)
2. 1401 Basic RPG (4K)
3. 1401 RPG
4. 1401/1460 RPG (on disk)
5. 1440 RPG (2K)
6. 1440 Basic RPG (4K)
7. 1440 RPG (on disk)
8. 1440 Sterling Basic RPG (4K)
9. 1440 Sterling ROG (1311)

The 1401 RPG processor will be handled after the program has first been translated to 1401/1460 RPG (on disk) using the 1401 RPG Translator program. Program input is 1400 series RPG source program cards; output is System/360 RPG source program cards for input, calculation, and output specifications. Non-translatable conditions will be flagged as they are detected by the translator.

MINIMUM SYSTEM REQUIREMENTS - An 8K 1401 or 1460 with 1402 Card Read Punch... 1403 Printer, Model 2 or Model 3 (on 1460)... three 7330 or 729 Tape Units or one 1311 Disk Storage Drive or one 1301 Disk Storage Unit (on 1460)... Advanced Programming and High-Low-Equal Compare special features (on 1401) or Indexing and Store Address Register feature (on 1460).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program write-up... Program Material List... sample program translation listing... System/360 RPG Translator manual... logic manual.
MACHINE READABLE - Card decks for translator object program, sample program 1400/RPG source, sample program System/360 RPG source.

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OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - The Translator source program.

ORDERING INFORMATION: PROGRAM NUMBER 1401RG700

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
OPTIONAL	none	MT 7/556	22	01
		MT 7/800	24	01

360C-SI-750 *M
7090/7094 SIMULATOR PROGRAM

DESCRIPTION - The 7090/7094 Simulator is a stand-alone System/360 program that uses System/360 components and logic to represent the simulated system. By interpreting 7090/7094 programs and data, the simulator reproduces the results that would be obtained on the original system. All standard 7090/7094 instructions and features are simulated, and in addition to 7090/7094 programs the simulator executes 709 programs and 704 programs designed for 8K and 16K running under the 704/709/7090 I/O Compatibility program. The functions of 7090/7094 input/output devices are performed by corresponding System/360 devices.

Note - Simulation of the 704/709/7090 I/O Compatibility program is provided to the users who retained an operational copy. This program is withdrawn and will not be provided.

MINIMUM SYSTEM REQUIREMENTS - The Simulator uses the System/360 Standard Instruction Set, Floating Point Arithmetic, and the Interval Timer. It also requires -

- A minimum of 262,144 bytes of main storage (model H).
- One 1052 Printer-Keyboard.
- One device for input of the 7090/7094 program.
- One device for simulator control information input.
- For each device simulated, one of the devices shown for it in the following table -

7090/7094 Device	System/360 Device
7151 Console	1052 Printer-Keyboard, any model compatible with the system.
711 Card Reader	1442 Card Read Punch, model N1, equipped with Card-Image option; or 2540 Card Read Punch; or 2401, 2402 or 2403 Magnetic Tape Unit, Model 1, 2, and 3 (7- or 9-track), 4, 5, or 6 (9-track). 2501 Card Reader, Model B1 or B2. 2520 Card Read Punch, Model B1.
721 Card Punch	1442 Card Read Punch, Model N1, equipped with Card-Image option; or 2540 Card Read Punch; or 2401, 2402 or 2403 Magnetic Tape Unit, Model 1, 2, and 3 (7- or 9-track). 1442 Card Punch, Model N2. 2520 Card Read Punch, Model B1. 2520 Card Punch, Model B2 or B3.
716 Printer	1443 Printer, Model N1 or 1403 Printer; or 2401, 2402 or 2403 Magnetic Tape Unit, Model 1, 2 and 3 (7- or 9-track), 4, 5 or 6 (9-track) or 1052 Printer-Keyboard, Model 1.
729 Magnetic Tape Unit (any model)	2400 Magnetic Tape Unit, Models 1, 2 or 3 (7-track or 9-track), 4, 5 or 6 (9-track).

Card Read Punch devices must be equipped with the Card Image feature (1442) and the Column Binary feature (2540), No. 1532, or with Data Mode 2 (2501, 2520). In some cases, the program input, control information input, and simulated-device functions can be handled by the same device.

The simulator produces correct output only for programs that work properly on the original system, but may produce incorrect output for time-dependent programs.

Information on simulation limitations and performance under simulation can be found in the SRL publication, System/360 Conversion Aids - The 7090/7094 Simulator for System/360, C28-6532.

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Performance under simulation depends largely on the balance of CPU and I/O operations. Estimates of performance under simulation are shown as ranges of throughput ratios for a number of typical programs. A ratio greater than 1.0 means that simulation on System/360 is faster than execution on the original system. These estimates are based on the following assumptions -

- The tape units used for simulation have at least the same data transfer rate in bytes as those of the simulated system in characters
- The termination conditions of tape read/write operations are normal.

The throughput ratios are -

Current System	System/360 Model 50	System/360 Model 65	System/360 Model 75
7090	0.07 - 0.30	0.25 - 0.75	0.30 - 0.80
7094/I	0.05 - 0.20	0.20 - 0.55	0.25 - 0.60

Factors that increase simulation throughput -

- Programs that are I/O bound.
- I/O data in 9-track simulator internal format.

Factors that decrease simulation throughput -

- Programs that are process bound.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... the 7090/7094 Simulator for System/360 Manual, C28-6532.
MACHINE READABLE - Object deck containing common programs, PREP 90, UPDATE 90, SIM 90, SYSINEND and sample program.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CSI750

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360C-SI-751 *M
IBM SYSTEM/360 7080 SIMULATOR

DESCRIPTION - The 7080 Simulator is a stand-alone System/360 program that, without additional hardware, enables programs that have been operating on a 7080 to be executed on any System/360 having a suitable configuration. Programs for 705 Models I, II, and III can be run if they are compatible with the 7080. This usually requires running the programs in conjunction with INT580. However, 705 Model III programs that can be run without INT580 on the 7080 will run on the Simulator within the restraints of the Simulator support. The Simulator produces correct results only for programs that work properly on the original system, and may produce incorrect results for time-dependent programs. By eliminating the requirement to convert all 7080 programs, the Simulator allows the user to apply most of his programming resources toward developing new applications and redesigning existing applications to take full advantage of System/360 facilities. Use of the Simulator also eases the pressure of program testing. The usefulness of the simulator can be extended indefinitely, since simulation may prove to be more economical than reprogramming for programs which are run infrequently. The reprogramming task is eased by allowing its deferment until system installation and testing are complete.

MINIMUM SYSTEM REQUIREMENTS - The Simulator operates with the Standard Instruction Set and the Decimal Arithmetic option. Main storage requirements depend on the 7080 memory being simulated, as follows -

7080 Memory (Characters)	System/360 Main Storage (bytes)
80,000	131,072 (model G)
160,000	262,144 (model H)

The System/360 must be equipped with the devices needed to service the Simulator, as well as those required to provide a configuration corresponding to that of the original system. The Simulator requires -

- One 1052 Printer-Keyboard.

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- One System/360 device for program input.
- One System/360 device for simulator control information input.
- One corresponding System/360 device for each simulated 7080 device.

If the Simulator program is to be loaded from a magnetic tape unit equipped with the 7-track Read Write Head No. 9557); the 7-track Compatibility feature (No. 7125) and the Data Conversion feature (No. 3228 or No. 3236) must be installed on the associated tape control unit. After the program has been loaded, this System/360 device is available for simulating a 7080 corresponding device (see below). For each 7080 device simulated, one of the System/360 devices shown in the following table is also required. In some cases, the program input, control information input, and simulated 7080 device functions can be handled by the same System/360 device.

7080 Device	System/360 Device
7153 Console Control Unit, Model 1.	1052 Printer-Keyboard (any model compatible with the system).
7502 Console Card Reader, Model 1.	2540 Card Read Punch, Model 1. 1442 Card Read Punch, Model N1. 2501 Card Reader, Model B1 and B2. 2520 Card Read Punch, Model B1.
729 Magnetic Tape Units (any model)	2401, 2402, 2403 Magnetic Tape Units, Model 1, 2 or 3. (7- or 9-track).

Note - Models 4,5 and 6 of the 2400 Series Tape Units cannot be used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... IBM System/360 Conversion Aids - The 7080 Simulator for IBM System/360 Manual, C28-6531.
MACHINE READABLE - 7080 Simulator object program containing common programs, SIN 80, PREP 80, UPDATE 80, SYSINEND and the sample problem program.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CSI751

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360C-SI-752 *M
1620 SIMULATOR PROGRAM

DESCRIPTION - The 1620 Simulator is a stand-alone System/360 program that uses System/360 components and logic too represent the simulated system. By interpreting 1620 programs and data, the simulator reproduces the output that would be otained on the original system. 1620 core storage capacities from 20,000 to 60,000 dicimal digits are simulated, as well as all standard features and the following optional features -

- Additional instructions for 1620, Model 1 (No. 1021).
- Automatic Divide for 1620, Model 1 (No. 1285).
- Automatic Floating Point (Nos. 1288, 1289).
- Indirect Addressing (No. 4650).
- Index registers for 1620, Model 2 (No. 4627).
- Additional core storage - 20K and 40K.
- 1443 Printer.
- 1311 Disk Storage Drive, Models 2 and 3.

MINIMUM SYSTEM REQUIREMENTS - The simulator uses the System/360 Standard Instructions Set. It also requires:

- Main storage - 32,768 bytes (Model E) if simulated system is 20K... 65,536 bytes (Model F) if simulated system is 40K... 131,072 bytes (Model G) if simulated system is 60K.
- One 1052 Printer-Keyboard.
- One device for input of the 1620 program.
- One device for simulator control information input.
- For each device simulated, one of the devices shown for it in the following table -

1620 Device	System/360 Device
1620 Console	1052 Printer-Keyboard with 1051 Control Unit for Model 30.
1622 Card Read Punch	2540 Card Read Punch with 2821 Control Unit. 1442 Card Read Punch, Model N1. 2520 Card Read Punch, Model B1 or a combination of the following - 2501 Cad Reader, Model B1 or B2. 1442 Card Punch, Model N2. 2520 Card Punch, Model B2 or B3.
1621 Paper Tape Reader	2671 Paper Tape Reader with 2822 Paper Tape Control Unit. 2540 Card Read Punch with 2821 Control Unit. 1442 Card Read Punch, Model N1. 2520 Card Read Punch, Model B1. 2501 Card Reader, Model B1 or B2.
1621 Paper Tape Punch	2540 Card Read Punch with 2821 Control Unit. 1442 Card Read Punch, Model N1. 1442 Card Punch, Model N2. 2520 Card Read Punch, Model B1. 2520 Card Punch, Model B2 or B3.
1443 Printer, Model 2	1443 Printer, Model N1; or 1403 Printer, Model 2, 3 or N1 with 2821 Control Unit.
1311 Disk Storage Drive, Model 2 or 3	2311 Disk Storage Drive with 2841 Control Unit

In some cases, the program input, control information input, and simulated-device functions can be handled by the same device. The Simulator produces correct output only for programs that work properly on the original system, and may produce incorrect results for time-dependent programs. Information on simulation limitations and performance under simulation can be found in the SRL publication, System/360 Conversion Aids - the 1620 Simulator for System/360, C28-6529.

Performance under simulation depends largely on the balance of CPU and I/O operations. Estimates of performance under simulation are shown as ranges of throughput ratios for a number of typical programs. A ratio greater than 1.0 means that simulation on System/360 is faster than execution on the original system. These estimates are based on the following assumptions -

- The tape units used for simulation have at least the same data transfer rate in bytes as those of the simulated system in characters
- The termination conditions of tape read/write operations are normal.

The throughput ratios are -

1620 Configuration	System/360 Model 30	System/360 Model 40
Model 1, paper tape	.20 - 2.85	.55 - 2.85
Model 1, cards	.20 - 1.05	.55 - 1.90
Model 2, cards	.05 - .55	.15 - 1.90
Model 2, paper tape	.05 - 2.85	.15 - 2.85

Factors that increase simulation throughput -

- Programs that are I/O bound.

Factors that decrease simulation throughput -

- Programs that are process bound.
- Programs using disk operations in "track mode"

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... The 1620 Simulator for System/360 Manual, C28-6529.
MACHINE READABLE - The 1620 simulator object decks which include all simulator functions in assembled form, plus sample problem programs.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CSI752

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		MT 7DC/800	26	01
		DTR 9/800	28	none
		MT 9/1600	29	01
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360C-SI-753
7070/7074 SIMULATOR PROGRAM

DESCRIPTION - The 7070/7074 Simulator is a stand-alone System/360 program that uses System/360 components and logic to represent the simulated system. By interpreting 7070/7074 programs and data, the Simulator reproduces the output that would be obtained on the original system. 7070/7074 core storage capacities from 5,000 to 30,000 words are simulated, as well as all standard features, Floating Decimal Point (Option No. 4420), and Additional Storage (Option No. 1017). The functions of 7070/7074 input/output devices are performed by corresponding System/360 devices.

PROGRAMMING SYSTEMS - Source language is S/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - A System/360 Standard Instruction Set and the Decimal Arithmetic option. It also requires -

- Main storage - 131,072 bytes (Model G) if simulated system is 5K or 10K... 262,144 bytes (Model H) if simulated system is 15K to 30K.
- One 1052 Printer-Keyboard.
- One device for input of the 7070/7074 program.
- One device for simulator control information input.
- For each device simulated, one of the devices shown for it in the following table -

7070/7074 Device	System/360 Device
7150 Console	1052 Printer-Keyboard, any model compatible with the system.
7500 Card Reader	2540 Card Read Punch; or 1442 Card Read Punch, Model N1; or 2401, 2402, or 2403 Magnetic Tape unit, Models 1, 2, and 3 (9-track only). 2501 Card Reader, Model B1 or B2. 2520 Card Read Punch, Model B1.
7501 Console Reader	2540 Card Read Punch; or 1442 Card Read Punch, Model N1. 2501 Card Reader, Model B1 or B2. 2520 Card Read Punch, Model B1.
7550 Card Punch	2540 Card Read Punch; or 1442 Card Read Punch, Model N1; or 2401, 2402 or 2403 Magnetic Tape Unit, Models 1, 2 and 3 (9-track only).
729 Magnetic Tape Unit (any model)	2401, 2402, or 2403 Magnetic Tape Unit, Models 1, 2, and 3 (7-track or 9-track).

(Note that Models 4, 5 and 6 of the 2400-series Tape Units cannot be used).

In some cases, the program input, control information input, and simulated-device functions can be handled by the same device. The Simulator produces correct output only for programs that work properly on the original system, and may produce incorrect output for time-dependent programs. Information on simulation limitations and performance under simulation can be found in the SRL publication, System/360 Conversion Aids - 7070/7074 Simulator for System/360, C28-6530. Performance under simulation depends largely on the balance of CPU and I/O operations. Estimates of performance under simulation are shown below as ranges of throughput ratios for a number of typical programs. A ratio greater than 1.0 means that simulation on System/360 is faster than execution on the original system. These estimates are based on the following assumptions -

- The tape units used for simulation have at least the same data rate in bytes as those of the simulated system in characters.
- The termination conditions of tape read/write operations are normal.

The throughput ratios are -

Current System	System/360 Model 50	System/360 Model 65
7070	0.3 - 0.8	0.8 - 1.7
7074	0.2 - 0.4	0.7 - 1.2

Note - Input and output are assumed to be 9-track and in simulator internal format.

Factors that increase simulation throughput -

- Use of the additional storage mode.
- Programs that are I/O bound (except 7070 on Model 65).

Factors that decrease simulation throughput -

CONTINUED FROM PRIOR COLUMN

- I/O data not in simulator internal format.
- Programs that are process bound (except 7070 on Model 65).
- In 7074 programs, a high percentage of floating point operations.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... Conversion Aids for the 7070/7074 Simulator Manual, C28-6530.
MACHINE READABLE - The object programs (all Simulator functions and supporting functions) and the sample program.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360CSI753

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	9/800	28	none
		DTR	9/1600	29	none
		DTR	7DC/800	26	none
OPTIONAL	none	MT	9/800	28	02
		MT	9/1600	29	02
		MT	7DC/800	26	02

360C-SI-754 *M
IBM SYSTEM/360 1410/7010 SIMULATOR PROGRAM

DESCRIPTION - The 1410/7010 Simulator Program is a stand-alone System/360 program that enables programs that have been operating on a 1410/7010 to be executed on a System/360 having a suitable configuration. By providing program "Compatibility", the simulator relieves reprogramming schedules, and can eliminate the need to convert infrequently used programs. The simulator produces correct results only for programs that work properly on the original system, and may produce incorrect results for time-dependent programs.

PROGRAMMING SYSTEMS - Source language is S/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - The System/360 must be equipped with the devices needed to service the simulator, as well as those required to provide a configuration corresponding to that of the original system. The simulator requires -

- One 1052 Printer-Keyboard.
- One device for program input.
- One device for simulator control information input.
- One corresponding device for each simulated device.

In some cases, the program input, control, and simulated-device functions can be handled by the same device. Performance under simulation depends largely on the balance of CPU and I/O operations.

Throughput - Estimates of performance under simulation are shown below as ranges of throughput ratios for a number of typical programs. A ratio greater than 1.0 means that simulation on System/360 is estimated to be faster than execution on the original system. These estimates are based on the following assumptions -

- The tape units used for simulation have at least the same data transfer rate in bytes as those of the simulated system in characters.
- The termination conditions of tape read/write operations are normal.

The throughput ratios are -

Current System	System/360 Model 40	System/360 Model 50	System/360 Model 65
1410	.20-.35	.40-.70	
7010		.25-.50	.55-.85

Factors that increase simulation throughput -

- Programs which are I/O bound on 1410/7010.
- I/O data in simulator internal format with odd parity alternate mode.

Factors that decrease simulation throughput -

- Programs which are process bound on 1410/7010.
- I/O data not in simulator internal format.

The 1410/7010 Simulator handles all standard features and the following optional features of the simulated system -

- Floating Point Arithmetic.
- Processing Overlap (No. 5730).
- Priority Processing (No. 5620).

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- Inverted Print-Edit (comma-period).
- One to four channels.

The main restrictions and limitations are the following -

- 1401 Compatibility is not simulated.
- Programs which rely on 1410/7010 internal machine timing to overlap I/O and CPU operations may produce incorrect results.
- No more than 25 I/O devices can be simulated simultaneously.
- Only the main console functions are simulated.
- The length of records is limited to the size of the I/O buffers (5K to 120K characters, depending on the main storage capacity of the System/360 and on that of the 1410/7010 and the number of channels simulated).

The Simulator operates with the Standard Instruction Set and the Decimal Arithmetic option. Main storage requirements depend on the 1410 or 7010 core storage being simulated as follows -

1410 Core Storage (characters)	7010 Core Storage (characters)	System/360 Main Storage (bytes)
10,000		65,536 (Model F)
20,000		65,536 (Model F)
40,000	40,000	131,072 (Model G)
60,000	60,000	131,072 (Model G)
80,000	80,000 (2 channels)	131,072 (Model G)
	80,000 (4 channels)	262,144 (Model H)
	100,000	262,144 (Model H)

A System/360 device corresponding to each 1410/7010 device to be simulated is required as follows -

1410/7010 Device	System/360 Device
1415 Console	1052 Printer-Keyboard, any model compatible with the System/360 configuration.
1402 Card Read Punch Model 2	2540 Card Read Punch.
1442 Card Reader, Model 3	1442 Card Read Punch, Model N1. 2501 Card Reader, Model B1 or B2. 2502 Card Read Punch, Model B1.
1403 Printer, Model 1, 2 or 3	1403 Printer, Model 2. 1443 Printer, Model N1.
729 Magnetic Tape Unit Models II, IV, V, VI 7330 Magnetic Tape Unit	2401, 2402, 2403 Magnetic Tape Models 1, 2 or 3.

Note - 2400 Series Tape Units (Models 4, 5 and 6) cannot be used. Simulation of the 1402 Card Read Punch (Model 2), with 51-Column Interchangeable Read Feed feature (No. 4150) requires a 2540 Card Read Punch with 51-Column Interchangeable Read Feed Feature (No. 4151). Simulation of the 1402 Card Read Punch (Model 2), with Read and Punch Column Binary Feature (No. 6025) requires a Column Binary - Data Mode 2 feature on the 2821 Control Unit (No. 1990). Any 2400-Series Magnetic Tape Unit used to read or write 7-track tapes must be equipped with the 7-track Compatibility Feature (No. 7125) and a 7-track Read/Write Head (No. 9557). The 7-track Compatibility feature must be installed on the associated tape control unit. Information on simulation limitations and performances under simulation can be found in the SRL publication, IBM System/360 Conversion Aids - The 1410/7010 Simulator for the IBM System/360, C28-6528.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... IBM System/360 Conversion Aids - 1410/7010 Simulator for IBM System/360 Manual, C28-6528.
MACHINE READABLE - Common programs, SIM 10, PREP 10, UPDATE 10, SYSINEND and sample program.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CSI754

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	9/800	28	none
		DTR	9/1600	29	none
		DTR	7DC/800	26	none
OPTIONAL	none	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01

360C-SI-755 *M

S/360 MODEL 44 SIMULATOR OF THE IBM 1620 DATA PROCESSING SYSTEM

DESCRIPTION - The System/360 Model 44 Simulator of the 1620 is a stand-alone System/360 Model 44 program that, without additional components, enables programs that have been operating on a 1620 to be executed on any System/360 Model 44, having a suitable configuration. 1620 core storage capabilities from 20,000 to 60,000 decimal digits are simulated, as well as all standard features and the following optional features -

- Additional instructions for 1620, Model 1 (No. 1021)
- Automatic Divide for 1620, Model 1 (No. 1285).
- Automatic Floating Point (Nos. 1288, 1289).
- Indirect Addressing (No. 4650).
- Index Registers for 1620, Model 2 (No. 4627).
- Additional core storage - 20K and 40K.
- 1443 Printer, Model 2
- 1311 Disk Storage Drive, Models 2 and 3.

The Simulator produces correct results only for programs that work properly on the original system, and may produce incorrect results for time-dependent programs. The following features and functions are not simulated -

- Binary capabilities for 1620 Model 2.
- 1627 Plotter and 1626 Plotter Control.
- 1710 Control System.
- 1620 Stop/SIE Key
- Synchro-check of the 1443 Printer.

The following may impose a limitation for certain programs -

- The Simulator stops, enters 1620 Manual Mode, and prints an error message in any of the following cases: Illegal operation code; non-decimal character in address; wrong I/O code; branch to odd location; even address in alphameric I/O operations.
- Unpredictable results can occur from: Invalid codes in arithmetic and floating-point operations; use of mantissas of different lengths; overlapped I/O and CPU operations that rely on 1620 internal timing.
- Core storage wrap-around is limited to: Transmit field and transmit field immediate; transmit record and transmit record no record mark; transfer numerical strip; transfer numerical fill; transmit floating; read numerically; read alphamerically; write numerically; write alphamerically; dump numerically (cards).
- Wrap-around cannot occur for instructions which do not fit in at the end of simulated core storage.
- The function of the 1620 (Model 2) Correction Key is performed by a 1052 cancel operation.
- A parity check in CPU operations causes a System/360 halt in the wait and disabled states.
- Testing the memory buffer register parity indicators (MBR-E or MBR-O) results in a negative (off) response.
- The "quotient plus remainder" and "product" area is limited to 100 positions (1620 addresses 00000 through 00099).
- All digits must be decimal in the add and multiply tables.
- Special characters in the P field are processed, but not checked.
- Step-by-step execution of 1620 instructions cannot be accomplished with the simulated stop key.
- One 2311 Disk Pack is required to simulate each 1311 Disk Pack.
- A special procedure (described in the simulator SRL) must be used to turn off printer channel 9 and channel 12 indicators.
- Flags are not printed, but special and alphabetic characters are substituted for flagged numbers.
- When simulating the 1622 Card Read Punch by one 1442 Card Read Punch, Model N1, or one 2520 Card Read Punch, Model B1, reading and punching cannot be performed simultaneously. When only one unit is used for both functions, it will be the users responsibility to perform the necessary card merging and sorting operations.
- Each valid punched 1620 paper tape character corresponds to a System/360 card punch character. Any paper tape record format that can be punched by the 1621 is punched by the simulator. The data on the cards punched by the simulator are images of the data in main storage, in the simulator internal code (EBCDIC).

PROGRAMMING SYSTEMS - Source language is S/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - The Simulator uses the System/360 Model 44 Instruction Set. It also requires -

- 2044 Processing Unit - 65,536 bytes (Model F) if simulated system is 20K or 40K, 131,072 bytes (Model G) if simulated system is 60K.
- One Multiplexer Channel (No. 5248 or No. 4598).
- One 1052 Console Printer-Keyboard.
- One device for input of the 1620 program.
- One device for simulator control information input.
- For each device simulated, one of the devices shown for it in the following table -

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1620	System/360 Model 44 Device
1620 Console Typewriter	1052 Printer-Keyboard
1621 Paper Tape Reader	2671 Paper Tape Reader with 2822 Paper Tape Control Unit 2540 Card Read Punch with 2821 Control Unit 1442 Card Read Punch, Model N1 2520 Card Read Punch, Model B1 2501 Card Reader, Model B1 or B2
1621 Paper Tape Punch	2540 Card Read Punch with 2821 Control Unit 1442 Card Read Punch, Model N1 1442 Card Punch, Model N2 2520 Card Read Punch, Model B1 2520 Card Punch, Model B2 or B3
1622 Card Read Punch	2540 Card Read Punch with 2821 Control Unit 1442 Card Read Punch, Model N1 2520 Card Read Punch, Model B1 a combination of 2501 Card Reader, Model B1 or B2 1442 Card Punch, Model N2 2520 Card Punch, Model B2 or B3
1311 Disk Storage Drive (Model 2 or 3)	2311 Disk Storage Drive with 2841 Control Unit
1443 Printer, Model 2	1403 Printer, Model 2, 3 or N1, with 2821 Control Unit 1443 Printer, Model N1

In some cases, the program input, control information input, and simulated-device functions can be handled by the same device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program material list... The 1620 Simulator for IBM System/360 Model 44, C28-6816.
MACHINE READABLE - All simulator functions in symbolic form, the supporting functions in assembled form, and a sample program deck are available.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360CSI755

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	9/800	28	01
		MT	9/1600	29	01
		MT	7DC/800	26	01
OPTIONAL	NONE	DTR	9/800	28	none
		DTR	9/1600	29	none
		MT	7DC/800	26	01

360F

SYSTEM/360 MODEL 44 PROGRAMMING SYSTEM

DESCRIPTION - The Model 44 Programming System provides FORTRAN and Assembler Language processing and program execution in a monitored environment, with automatic job-to-job transition, interruption handling, and input/output supervision. The system has facilities for the creation and maintenance of libraries and the manipulation of their contents. It also provides extensive job control and modular programming capabilities for flexibility and versatility in the preparation of programs for execution. It will utilize all available core storage. Programs utilizing Direct Data Channel, Direct Word, or Priority Interruption features cannot be executed under the supervisor.

The system resides on a 2315 Disk Cartridge mounted on the Model 44 single disk storage drive. In includes a supervisor, a set of support programs that perform system-related and utility functions, and two language processors - a Full FORTRAN IV Compiler and an Assembler. It also includes six stand-alone (i.e., not operating under system control) programs that are not resident on the 2315 Disk Cartridge - A program to construct the executable programming system from the distributed card decks; A loader for loading system-produced programs that are in absolute form; and are to be executed independently of system control; two disk initialization programs (2315 and 1316); a Save/Restore program for saving the contents of a disk on tape and later restoring the disk; and a special purpose print/punch program for printing or punching selected files of the tape containing the IBM distributed system. The system requires 16,896 bytes to be permanently resident in core storage and 104 tracks (approximately 290,000 bytes) for the entire system residence on the single disk storage drive (SDSD). Additional space must be reserved on the SDSD when the system is initally created

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for system scratch areas and user additions to the phase and module libraries.

SUPERVISOR - 360F-IO-613

The Supervisor controls the entire system and provides a common interface to all processing programs, including the FORTRAN Compiler, the assembler, the system support programs, and user-written programs. Specifically, the supervisor -

- manages the use of system resources.
- loads the appropriate execution phases from the phase library (i.e., the library of programs in absolute form, ready for execution).
- handles all standard label checking, input/output requirements, and input/output error recovery procedures.
- services interruptions and passes control to the appropriate system or user routine for interruption processing.
- schedules channel use to effect overlap of processing with input/output operations.
- provides for communication with the console operator.

ASSEMBLER - 360F-AS-616

The assembler translates System/360 Assembler Language programs to relocatable object program modules. The Assembler Language consists of all System/360 Model 44 instruction mnemonics, literals, and a set of assembler instructions that direct the assembly process. It includes an optional update facility. Observing the qualifications listed below, programs written for the Model 44 Assembler may be assembled by the TOS/DOS assemblers and the OS/360 assembler. Similarly, programs written for the BOS assemblers may be assembled by the Model 44 assembler.

- The Model 44 assembler will only assemble instructions included in the Model 44 instruction set. There are four special instructions unique to the Model 44 that cannot be assembled on other System/360 assemblers.
- The assembler's update instructions are unique to the Model 44 and cannot be processed by any other assembler.
- If variable symbols are used, care must be taken prior to assembly in other systems to ensure that LCLA declaration exists for all variable symbols.
- The user must ensure that each program observes the subroutine linkages and supervisor calls appropriate to the system that the program will run under.

FORTRAN IV - 360F-FO-618

The FORTRAN IV Compiler translates programs written in the FORTRAN Language to relocatable object program modules. The compiler accepts programs written in the Full FORTRAN IV Language. No debug facilities are available however. Programs may be written in either BCD or EBCDIC. The compiler tests for usages of official FORTRAN library routine names to ensure correspondence with respect to the number and type of arguments used. The FORTRAN Language manual warns against the declaration of COMMON and Equivalence data in such a way as to cause data to be improperly aligned, e.g., double precision data not on double word boundaries. If such a condition is detected, a warning message will be printed at compile time but execution will be allowed to begin. If a specification condition occurs at execution time, a fix-up routine will be loaded automatically into main storage and the data adjusted so that execution can continue. A facility is provided in the FORTRAN library for calling the Fetch and Load Supervisor facilities of the 44PS. The Model 44 FORTRAN IV is compatible with and encompasses the standard (USA) FORTRAN. Programs written in BPS, TOS, DOS FORTRAN or OS E Level FORTRAN may be compiled by the Model 44 FORTRAN IV. OS/360 FORTRAN IV G and H are compatible with Model 44 FORTRAN IV.

FORTRAN IV Library - 360F-LM-619

The FORTRAN Library contains subprograms which can be called by FORTRAN object programs.

JOB CONTROL - 360F-CL-614

The Systems Job Control Processor is loaded before each job step. It reads and interprets the problem program's Job Control statements and provides requested services and facilities. The statements, in general, describe the machine and system resources that will be required to execute the program. They indicate which optional system features will be desired, and they specify administrative functions that should be performed.
When the Job Control Processor finishes processing control statements, it causes loading of the required phases into main storage from the Phase Library and initiates execution of the job step. At the end of the job, the Job Control Processor provides requested End-of-Job services and restores the system to its status as of the beginning of the job. It then begins processing control statements for the next job.

LINKAGE EDITOR - 360F-ED-615

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The Systems Linkage Editor Program converts assembler and compiler output modules into a form suitable for loading and execution. All programs to be executed under system control must first be processed by the linkage editor.

A problem program may consist of one language processor output module, or it may be made up of several modules, including some from previously executed jobs, that must be combined with new modules. A module may be independent and self-contained, or there may be numerous cross-references between modules and between control sections within modules. In processing a problem program, the linkage editor converts input modules into one or more phases. A phase is a segment of machine-language code that is loaded into main storage by a single Fetch or Load Supervisor Call. It may contain one or more of the modules that were input to the linkage editor. Its size and composition are determined by the programmer. More than one phase may be resident in main storage at a time, and a program may be designed so that one phase is not loaded until execution of another phase in the same program has been completed.

UTILITIES - 360F-UT-617

The Systems Utility Routines handle many of the routine tasks that are common to all computer installations. These include initialization of disks and magnetic tapes, listing the contents of storage volumes and transferring data from one type of storage to another, such as from cards to tape.

STAND-ALONE PROGRAMS

In addition to the Model 44 Programming System, six stand-alone programs are provided. They operate independently of system control. They are stand-alone because they are required to construct the system and are also used to modify it.

2315 DISK INITIALIZATION - 360F-UT-607

The 2315 Disk Initialization Program prepares a disk for program use, assigning an alternate track to any track that the Disk Initialization Program has recognized as defective. It also assigns an alternate track for a track recognized as defective during normal system operation.

2311 DISK INITIALIZATION - 360F-UT-608

The 2311 Disk Initialization Program prepares a disk for program use, assigning an alternate track to any track that the Disk Initialization Program has recognized as defective. It also assigns an alternate track for a track recognized as defective during normal system operation.

SYSTEM CONSTRUCTION - 360F-UT-612

This program constructs an IBM Model 44 Programming System Residence Volume (on a 2315 Disk Cartridge) from punched cards.

ABSOLUTE LOADER - 360F-UT-611

This program loads card decks that are to be executed independently of system control.

SAVE/RESTORE - 360F-UT-609

Thie program copies on tape the contents of a 2315 Disk Cartridge or 1316 Disk Pack and copies onto a 2315 Disk Cartridge or 1316 Disk Pack the data previously saved on tape.

PRINT/PUNCH - 360F-UT-610

This program punches the text of the distributed tape reel (DTR) and prints the table of contents and any other EBCDIC file that is on the DTR.

CORE DUMP - 360F-UT-606

A new stand alone utility that provides for dumping core sizes of 64K or greater, the 16 standard registers and the floating-point registers, if they exist.

SYSTEM EDITOR - 360F-UT-620

This new utility program operates under control of 44 PS and allows modifications to members of either the absolute or relocatable libraries.

MINIMUM SYSTEM REQUIREMENTS

- 2044 Processing Unit with its console printer-keyboard, single disk storage drive, and at least 65,536 bytes of main storage.
- One multiplexor channel (No. 5248 or No. 4598).
- One 2315 Disk Cartridge (used for Systems Residence).
- One of the following Input units - 1442 MDL N1 Card Read/Punch... 2501 MDL B1 or B2 Card Reader... 2520 MDL B1 Card Read/Punch... 2540 MDL 1 Card Read/Punch... 2401 or 2402 MDL 1, 2, 3, 4, 5, or 6 Magnetic Tape Unit... 2403 MDL 1, 2, 3, 4, 5, or 6 Magnetic Tape Unit Control... 2404 MDL 1,2, or 3 Magnetic Tape Unit and Control... 2311 Disk Storage Drive.
- One of the following output listing units - 1403 MDL 2, 3, 7 or N1 Printer... 1443 MDL N1 Printer... Any of the magnetic tape units listed above... 2311 Disk Storage Drive.
- One of the following output punching units - 1442 MDL N2 Punch... 2520 MDL B2 or B3 Punch... Any of the card read/punches listed above... Any of the magnetic tape units listed above... 2311 Disk Storage Drive.
- In addition to the above requirements, the system supports the attachment of - a second single disk storage drive (with 2315 Cartridge), which, alternatively, may be used for Systems Residence... Additional 2311 Disk Storage Drives (with 1316 Disk Pack)... Additional magnetic tape units *any of the modules listed above)... Additional multiplexor channels to a maximum of 3.
- A System Residence 2315 Disk Cartridge can be created using the minimum machine configuration, provided the input device is a card reader. Assembly is not required in this procedure. However, if it is desired to assemble the source language version of the IBM-supplied components of the system, at least one magnetic tape drive is required. If re-assembly is desired, a second single disk storage drive and a second magnetic tape drive should be included for optimum system editing.
- If more than 65,536 bytes of main storage are available, the system will take advantage of their availability.
- The FORTRAN Compiler requires that the 2044 be equipped with the Floating-Point Arithmetic feature (No. 4427). The Assembler also requires this feature if it is desired to assemble floating-point constants.
- The user may modify the supervisor to include input/output routines for additional devices (provided these devices have Start, Device End, and Channel End characteristics similar to those of the supported devices). These characteristics are detailed in System/360 Principles of Operation, A22-6821, and the appropriate unit manuals.
- The Read-Backward feature of the 2400 Series Magnetic Tape Units is not supported.

BASIC PROGRAM PACKAGE

DOCUMENTATION - Program Material List... Guide to System Use, C28-6812... FORTRAN Programmer's Guide, C28-6813... Systems Programmer's Guide, C28-6814... Operator's Guide, C28-6815.

MACHINE READABLE - Object code for the following 360F components is available.

Program Title	Program Number	Program No. Extension
	360F	none
Supervisor	IO613	
Assembler	AS616	
FORTRAN IV	FO618	
FORTRAN IV Library	LM619	
Job Control	CL614	
Linkage Editor	ED615	
Utilities	UT617	
2315 Disk Initialization	UT607	
2311 DISK INITIALIZATION	UT608	
System Construction	UT612	
Absolute Loader	UT611	
Save/Restore	UT609	
Print/Punch	UT610	
Stand-Alone Dump Program	UT606	
System Editor	UT620	

OPTIONAL PROGRAM PACKAGE

DOCUMENTATION - Optional Program Material List.

MACHINE READABLE - Option 1 - Source code for all components except the FORTRAN Compiler and FORTRAN Library, and is specified by using Program Number Extension OPT1.

Option 2 - Source code for the FORTRAN Compiler and FORTRAN Library, and is specified by using Program Number Extension OPT2.

ORDERING INFORMATION: (TAPE USERS) SYSTEM NUMBER 360F

Note: Both basic and optional machine readable material for this system is ordered by specifying a "System Line" (columns 1-7, 15-24) and "Component Lines" (Columns 8-12) of the program order form. Enter a separate component line for each component desired. Respecify the system line for each different Program Number Extension.

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	OPT1	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01

CONTINUED FROM PRIOR PAGE

OPT2	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	26	01

Basic machine readable material for all 360F Programs, in addition to being available to tape users, can be obtained in card form. If cards are preferred, specify each program desired in columns 4-12 and specify medium code 15 in columns 21-22 of the program order form.

PROGRAM TITLE	PROGRAM NUMBER
SUPERVISOR	360FIO613
ASSEMBLER	360FAS616
FORTRAN IV	360FFO618
FORTRAN IV LIBRARY	360FLM619
JCB CONTRCL	360FCL614
LINKAGE EDITOR	360FED615
UTILITIES	360FUT617
2315 DISK INITIALIZATION	360FUT607
2311 DISK INITIALIZATION	360FUT608
SYSTEM CCNSTRUCTION	360FUT612
ABSOLUTE LCADER	360FUT611
SAVE/RESTORE	360FUT609
PRINT/PUNCH	360FUT610
STAND-ALONE DUMP PROGRAM	360FUT606
SYSTEM EDITOR	360FUT620

ORDERING INFORMATION: (Card Users Only) Program numbers are shown directly above.

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
OPTIONAL	OPT1	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01
	OPT2	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01

360G-CL-627

TIME SHARING SYSTEM/360 FOR 2311 AND 2314 SYSTEM RESIDENCE

DESCRIPTION - PL/1 Level-F, Version 5, has been programmed to operate in the TSS/360 environment. PL/1 programs can be compiled and executed on TSS/360 in the 24-bit virtual memory addressing mode. Compatibility with OS PL/1-F is provided, except for SORT/MERGE, multitasking, checkpoint and the regional I/O and QTAM facilities of the I/O environment option. An option is available through the use of a new LCGON parameter to limit the virtual memory address to 24 bits, allowing PL/1 to run while other programs operate with 32-bit hardware.

Remote Job Entry (RJE) has been incorporated into the system. This function supports a 2780 Model 1 terminal that is attached via a 2701 Data Adapter Unit and permits the user to initiate any batch or non-conversational job from this terminal. All outputs created by the remote job are returned to the originating 2780 unless otherwise directed, RJE output can be directed to other RJE stations or to the system high-speed printer. The remote job function interfaces with the system as an extension of the current BUILT I/O facility. RJE will operate with a 2780 that is equipped with or without the multiple Record Transmission feature. The 2780 will operate through a 2703 Data Adapter Unit with modifications introduced at SYSGEN time. On Line Test facilities for the 2701 and the 2780 are not provided in this release.

PERFORMANCE

Many improvements have been made to reduce system paging and enhance performance.

- Various system modules have been recorded to reduce working storage and paging operations.
- 22 FORTRAN I/O modules have been combined into a single module, minimizing paging.
- The Link Editing of FORTRAN control sections has been redefined, reducing the number of pages referenced during compilation.
- Conversion of the EXECUTE, REPLY, ERASE, and DELETE commands from PROCDEFs to BUILT-INs results in saving many paging operations.
- The order of the hashing chains constructed by the Dynamic Loader is rearranged so the most recent definition is retrieved first, reducing paging for the loader.
- Paging for language processors and other system programs has been reduced.
- Device Management has been changed to improve performance.

CONTINUED FROM PRIOR CCLUMN

TSS now provides users with the ability to selectively load modules associated with certain functions. By specifying the functions to be deleted at startup time, the related control sections will automatically be eliminated from the loading and linking process.

HUMAN FACTORS

Most system messages in the user's message file have been improved for purposes of standardization and clarity.

All Program Control System (PCP) diagnostic, warning and prompting messages have been made available in the user's message file. Through his user profile a user is able to eliminate or shorten messages allowing neater and more readable output frcm AT, GO and BRANCH commands.

PRMPT is a new command that helps the user retrieve messages and message explanations. He may insert his own variable information in many of these messages.

Two related commands, DDNAME? and JOBLIBS, are added to the Command System. DDNAME? displays all of the user's active data definition names and data set names, or just those in the Job Library chain. JOBLIBS moves an active job library into the top position of the program library list; with this command, the existing last-in first-out JOBLIB order can be overridden, providing more flexibility to the user in working with his program libraries.

The EXPLAIN and PERMIT commands have been extended and improved.

IF LOGON is entered without a required password, the system issues an "ENTER PASSWORD" prompt, and an overtyped line is provided following the prompt. The user then types his password on this overtyped line, providing improved security for his password by making it harder to read.

A solution is provided to reduce the keyboard/card internal format inconsistencies that affect FORTRAN applications involving the DATA command, multicard source statements, etc. A data-set-compression capability, allowing the use of variable-length records and the removal of blanks, is provided for use with card input.

Two new values are added to the BREVITY operand to direct the display of the standard or the extended message without the identification code.

The Command System Text Editor (e.g., the CONTEXT command) will now allow modification of existing data sets using hexadecimal notation.

When recompiling or reassembling a program module, the old version can be retained until the recompilation or assembly is completed, providing improved protection for the user's program library.

RELIABILITY AND SERVICEABILITY

The installation now has the facility to permit or prevent the creation of multivolume data sets on public storage.

The system will keep a dynamic count of the total estimated amount of auxiliary space specified, new tasks are not permitted to enter the system until other tasks are completed, preserving good performance for the current users. A SYSGEN parameter allows an installation to specify a greater percentage than the actual amount of auxiliary space available, for this purpose.

VAM interlocking is improved by replacing the bit interlocking facility with a single lock byte that will control access to the DSCB pages.

An alternate I/O Path Retry method is incorporated that does not require making the channel and/or control unit as being down.

I/O outboard error recordings are improved in contents, recording criteria, and format quality. Included are the date of the error, device type, volume identification, CSW status, home address, and the physical address for the 2314 devices.

On-Line tests are included to support the 1403, 2400, 2540 2541, and 2703.

MINIMUM SYSTEM REQUIREMENTS - One 2067 Mdl 1; two 2365 Mdl 2s; one 2860 Mdl 2 or two 2860 Mdl 1s; one 2870 Mdl 1; one 2821 Mdl 1 or 5; one 1403 Mdl 2 or Mdl 3 or Mdl N1 with one 1416 Mdl 1; one 2540 Mdl 1; one 2820 Mdl 1; one 2301 Mdl 1; one 2314 DASF with at least five drives; one 2803 Mdl 1 and two 2401 Mdl 1, 2 or 3s or one 2402 Mdl 1, 2, or 3 or one 2403 Mdl 1, 2, or 3 and one 2401 Mdl 1, 2 or 3; one 2702 Mdl 1 or one 2703 Mdl 1; one 1052 Mdl 7; one 2741 Mdl 1 or one 1051 Mdl 1 or 2 and one 1052 Mdl 1 or 2; five

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2316s.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... Methods of printing the TSS System Prose. The following SRLs will be shipped:

System Generation and Maintenance	GC28-2010
Managers and Administrators Guide	GC28-2024
with TNL	GN28-3071
Operators Guide	GC28-2033
with TNL	GN28-3065
System Messages	GC28-2037
Independent Utilities	GC28-2038
with TNLs	GN28-3056
	GN28-3070
Addendum	GC28-2043

MACHINE READABLE - TSS Utilities... Restorable IPL Control VOL data... Restorable Auxiliary Control VOL data... TSS System Prose.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Program Material List... Source Volume Utilization.
MACHINE READABLE - Source Code is delivered in the fcllowing volumes:

Volume 1 - contains CES - Supervisor, CEB - Independent Utilities, CEH - Time Sharing Support Systems, CEI - Auxiliary Programs, CEY - Linkage Editor, CGC - Service Routines, CHE - System Tables, and is specified by using Program Number Extension VOL1.

Volume 2 - contains CEC - Access Methods, and CFA - Command System, and is specified by using Program Number Extension VOL2.

Volume 3 - contains CEK - FORTRAN Compiler, CEV - Assembler, CHC - FORTRAN Library Subroutines, CMA - Diagnostics, and CZU - Time Shared Utilities, and is specified by using Program Number Extension VOL3.

Volume 4 - contains IEM - PL/1 Compiler, and is specified by using Program Number Extension VOL4.

Volume 5 - contains IEM - PL/1 Compiler, IHE - PL/1 Library, and is specified by suing Program Number Extension VOL5.

ORDERING INFORMATION: PROGRAM NUMBER 360GCL627

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	9/800	28	02
OPTIONAL	VOL1	MT	9/800	28	01
	VOL2	MT	9/800	28	01
	VOL3	MT	9/800	28	01
	VOL4	MT	9/800	28	01
	VOL5	MT	9/800	28	01

360M *M

IBM SYSTEM/360 BASIC OPERATING SYSTEM (TAPE)

DESCRIPTION - TOS/360 is a tape operating system designed to provide operating system capabilities for 16K and larger tape oriented System/360 configurations. The following components of TOS/360 are described. One of the two available supervisors must be specified when ordering.

SYSTEM CONTROL PROGRAM - 360M-CL-405

System Control, 360M-CL-405 - A prerequisite to any component in TOS/360. The program forms the nucleus of the system and provides the functions of system control, generation and editing. Control program input/output assignments are - System Residence - System residence unit... System Reader - unit used for job control cards... System Input - main system input unit for control programs... System List - system printer unit for control programs... System Punch - system output unit for control programs... System Communication - medium used for operator communication.

Control functions are as follows:

- Initial Program Load - To initialize operation of the system.
- Job control - Brought into main storage by the supervisor to provide -- job-to-job transition, e. g., compile and execute... Symbolic device assignment within device dependent environment... Entry of additional information.
- Supervisor - the TOS/360 supervisor is to provide main storage resident control functions in a minimum of 6144 bytes. The size of the supervisor depends on the options specified at system generation time.

The configuration of control functions contained within

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6144 bytes is - Scheduling of I/O operations on the multiplexor and up to six selector channels (see note)... System Loader for program fetching... Transient Area for functions such as - error recovery, file management, (OPEN, CLOSE, End of Volume) End of Job, Checkpoint Restart, Storage Print, operator communications via 1052... 7-track tape handling... Physical I/O tables for ten devices.

Note - Burst Mode on the multiplexor channel can be included in the minimum supervisor in lieu of selector channel scheduling. (Burst mode is required if tapes are intermixed with byte interleave devices.)

Depending on the combination of supervisory functions chosen the following represent options which may cause the generation of a supervisor greater than 6144 bytes:

- Problem program exits for internal interrupts such as operator inquiry and Interval Timer.
- Storage Protection.
- Interval Timer.
- Tape error statistics.
- I/O tables for additional devices.
- Channel Switching.
- Program Check Interrupt Exit.

It can be assumed as a minimum that at least as many as 12 I/O devices and either Program Check Interrupt exits or Channel Switching can be included within a 6144 byte supervisor. A TOS/360 Supervisor generated with the Multiprogramming option can be included in an 8192 byte TOS/360 supervisor.

Multiprogramming will require as a minimum a System/360 configuration with 32K bytes of storage. The inclusion of multiprogramming capability in the system will result in the generation of a supervisor greater than 6K bytes regardless of the combination of other supervisory options which may be specified.

The total core requirements of the system supervisor is dependent on the combination of optional supervisory functions selected at system generation. Furthermore, the inclusion of the Storage Protection feature, which is required for multiprogramming, imposes a 2K boundry on the supervisor storage regardless of the actual storage utilized. There are two conditions which mitigate an arbitrary 2K boundary for supervisor storage. They are:

- Various portions of the supervisory Transient Areas can reside in unprotected storage (same as background problem program).
- Label storage areas normally part of the problem program area can reside within the unused area protected by the supervisor.

It is reasonable to assume that 10,240 bytes represents the maximum supervisor capable of generation in TOS/360 with respect to the complement of currently announced supervisory options. The Storage Protection feature is required for the Multiprogramming option. This requirement results from the fact that a multiprogramming system cannot effectively function without the assurance of continuous system operation in spite of errant problem programs.

The requirement for the Interval Timer is optional and is conditioned only on the application requirements and the use of certain system macro facilities. No arbitrary requirement for the interval timer is imposed by TOS/360.

Generation and editing functions are as follows:

- System Generation - To initialize the system residence, establish supervisor capabilities, include desired system functions and processing programs.
- Librarian - Used for maintaining the tape libraries and providing printed and punched output from the libraries. Three libraries are used - Core Image Library, Relocatable Library, and Source Statement Library.
- Linkage Editor - For linking and relocating separate program sections from Relocatable Libraries and/or from a system input unit, and editing into Core Image Libraries for loading by System Loader.

360M-SV-413 SUPERVISOR, 6K

360M-SV-414 SUPERVISOR, 8K

The two supervisor components are identical in content and function except for the ending address. The user who does not expect to generate a supervisor in excess of 6144 bytes should order the system with the 6K supervisor component. The user who expects to generate a supervisor in excess of 6144 bytes should order the system with the 8K supervisor component, this will allow him to assemble and catalog the tailored supervisor without link-editing all of the desired system components residing in the Core Image Library. However, if the tailored supervisor exceeds the size of the supervisors component on the system, a complete Linkage Edit run must be performed.

One supervisor component must be specified when ordering the system. If not specified, the 6K supervisor will be shipped.

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INPUT/OUTPUT CONTROL SYSTEM - 360M-IO-404

Input/Output Control System (IOCS), 360M-IO-404 - Logical IOCS is a set of macro instructions which handle logical files of data for the user on the devices supported. Among these functions are the following:

- Request physical I/O operations to be performed when necessary.
- Block and deblock logical records within physical records.
- Provide label handling capabilities via OPEN/CLOSE/EOV Routines.
- Switching between I/O areas when two areas are specified for a file.
- Automatic volume switching of system output file on magnetic tape.
- Combined system output files on a single magnetic volume.
- 7-Track Checkpoint with Translate Mode Data on magnetic tape (Data Conversion feature required).
- Dual density recording (800/1600 bpi).
- Enable/Disable Mode for Universal Character Set.
- Error Recovery involving Command Chaining Operations.
- Automatic retry of devices made ready following operator intervention type input/output errors.

COMPILER INPUT/OUTPUT MODULES - 360M-IO-412

These input/output modules used by COBOL and RPG object programs are pre-assembled and incorporated into the Relocatable Library. They provide all necessary input/output operations so that the user can execute programs written in COBOL and/or RPG without having to generate input/output modules.

1285 OPTICAL CHARACTER READER - 360M-IC-417

Optical Character Reader provides support of the IBM 1285 Optical Reader which reads tapes, such as those produced on cash registers and adding machines, directly into the system. The 1285 is now supported in a multiprogramming environment under DOS/360.

UTILITY PROGRAMS - 360M-UT-403

Utility Programs, 360M-UT-403 - The following utility programs will be on the distributed tape.

- Card to Printer and/or Punch - This program transfers binary or EBCDIC data from cards to a printer and/or a card punch.
- Card to Tape - This program transfers binary or EBCDIC data from cards to magnetic tape.
- Tape to Card - This program transfers data from magnetic tape to cards. Data may be punched in either EBCDIC or binary.
- Tape Compare - The tape compare program compares two files from two or more tapes to ensure that the files are identical.
- Tape to Printer - This program will print a tape file in one of two formats -
 . Data Display - Prints all of the tape block.
 . Data List - Prints one line for each data record.
- Tape to Tape - This program transfers the data from one tape to another.

MULTIPROGRAMMING SUPPORT UTILITY - 360M-UT-411

MACROS

These macros may be utilized to generate the following concurrent peripheral self-relocation utility programs which will operate in 2K bytes of problem program storage:

- Card to Print.
- Card to Tape.
- Tape to Print.
- Tape to Card.

The inclusion of any user programming with the above utilities may cause the storage requirements to exceed 2K bytes. (See description under multiprogramming.)

ON-LINE TEST EXECUTIVE PROGRAM - 360M-DN-418

OLTEP together with associated on-line unit tests allows testing of System/360 I/O devices while operating under control of the TOS/360 supervisor. OLTEP is a monitor program that controls the execution of individual routines designed to test specific I/O units. It can be run either in a dedicated batch-only environment or in the background partition of a multiprogramming system. This allows the user to continue performing productive work during the running of I/O unit tests. Except for specific I/O units being tested, all units of the system remain available to the user.

Some of the advantages of OLTEP are -

- Increased system availability.
- Improved serviceability.
- Productive work (in foreground partitions) during

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 servicing.
- System checkout following maintenance.

AUTOTEST - 360M-PT-407

Autotest, 360M-PT-407 - A debugging aid for object programs assembled by the TOS/360 Assembler and executed under the Basic Operating System. Using Autotest, a test run can be performed as a normal job in a batch, with a minimum of operator intervention. Autotest monitors the execution of the program under test and provides the following facilities:

- The creation of input data files by means of standard utility programs (IBM or user supplied).
- Exchange, addition or deletion of instructions without reassembly.
- Dump of any portion(s) of main storage, permanent storage assignments, general registers and/or floating point registers whenever a designated address is reached during program execution. The main storage dump can be in hexadecimal, character, Floating Point, Fixed Point, or mnemonic representation.
- Dump of main storage at normal or abnormal end of job in hexadecimal, character and/or mnemonic representation. Source symbols can also be printed with the End of Job dump.
- A list of all phases in the sequence that they are called into main storage.
- Print out of any output data files by means of standard utility programs (IBM or user supplied).

SORT/MERGE PROGRAM - 360M-SM-400

Sort/Merge Program, 360M-SM-400 - Orders unsequenced data into either ascending or descending sequence as specified on the sort control cards. The sort control statement cards permit a diversification of parameters to meet the needs of the magnetic tape user. These assignments of specified parameters maximizes the Sort performance to meet the configuration of the individual user. The sort employs IOCS standard label check or enables the user to bypass or process his non-standard labels. The utilization of the Checkpoint-Restart facility permits the user to interrupt and continue during the Merging phases of the sort. The Merge Only Option gives the user the facility of combining from one to seven presequenced files into a single output file. A sequence check and reblocking capability form an integral part of the Merge Option.

ASSEMBLER - 360M-AS-465

Assembler, 360M-AS-465 - A symbolic programming language used to write programs for the IBM System/360. The TOS/360 Assembler program processes the language and provides auxiliary functions useful in the preparation and documentation of a program, and includes facilities for processing macro instructions. Included in the language are the standard and optional instruction sets, mnemonics, extended mnemonics, literals and macro facilities. An extensive macro library is also included to provide facilities for system generation and I/O device macro support for processing programs.

REPORT PROGRAM GENERATOR - 360M-RG-408

Report Program Generator, 360M-RG-408 - An expanded language function that has the capability of compiling programs which can produce a wide variety of reports ranging from a simple listing to a complete report that incorporates calculation and edition. Sterling conversion, arithmetic, Table Lookup, branching capabilities, Indicator Control, Split Control fields, Move Left, and the designation of multiple input and output files are also provided.

COBOL - 360M-CB-402

COBOL provides a convenient method of coding programs to handle commercial data processing problems. It has the following advanced features - Source program library facility... COBOL debugging Language... Internal/External Floating Point items and Floating Point literals... The linkage section of the Data Division... Options 1, 2 and 3 of the Use sentence... The Transform Statement... Option 2 of the Apply clause... Inverted Print Edit... Rerun Clause which enables the user to Checkpoint his program periodically during its execution. It uses integer records. After the Checkpoint has been executed, the user may Restart his program using the TOS Restart procedures.

FORTRAN IV - 360M-FO-409

FORTRAN IV, 360M-FO-409 - The FORTRAN Language is especially useful in writing programs for scientific and engineering applications that involve mathematical computations. The IBM TOS/360 FORTRAN Language is compatible with the encompasses the proposed American Standards Association (ASA) Basic FORTRAN, including its mathematical subroutine provision. TOS/360 FORTRAN offers the following advanced features - Mixed-Mode... Spacing Format Code... Literal Format Code... The A Format Code... Scale Factor... Carriage Control... Double Precision Data Type... Three Dimension Arrays... Functional Subprograms may return

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results via the Argument List... Programs coded in BCD and EBCDIC can be compiled.

PL/I - 360M-PL-410

The PL/I compiler provides, in a single high-level language the following features -

- Comprehensive Data Conversion and editing facilities.
- Data structures for alphameric information.
- Ability to process a wide range of data types, including character and bit strings, fixed and floating decimal and fixed and floating binary.
- Both structured data and array data have arithmetic capability including expressions whose elements are simple variables, structured data, and arrays.
- Data Stream Transmission.
- Record transmission capability.
- PL/I-D has been extended to provide support for Sterling Picture Character 6, 7, 8 and to provide source statement numbers in the pseudo-assembler listing of the object code produced for each source statement.
- Two new debugging facilities to trace changed variables and program flows.
- Improved diagnostic capabilities of the compiler.
- New operands supported in the PROCESS card to allow for the overriding of job control options.
- Cross reference listing.

MINIMUM SYSTEM REQUIREMENTS - 16K bytes of main storage*... Standard Instruction Set**... One I/O channel (either multiplexor or selector)... One card reader***... One card punch***... One printer***... One 1052 Printer-Keyboard... One 2400 Series Magnetic Tape Unit for System Residence and three 2400 Series Magnetic Tape Units for language translation functions. An additional tape drive is required for Compile-and-Execute Options. 7-track tape units can be used, but the Data Conversion Feature No. 3228 or No. 3236 is required. 9-track residence is recommended because of the significant performance advantage it gives to the Program Fetch function.

* A 32K minimum system is recommended for COBOL object program execution and required for multiprogramming.
** Expanded Instruction Sets may be required depending upon the specific requirement of the language translators utilized.
*** See control program input/output chart for acceptable units. Note that one 2400 Series Magnetic Tape Unit may be substituted for those units. If 7-track drives are used, the Data Conversion feature is required, except when a tape is substituted for a printer.

Control Program Input/Output - TOS/360

Units Supported	Residence	Reader	Input	Work*	Punch	List	Log**
1052							X
2540		X	X		X		
1403						X	X
1404						X	X
1442 N1		X	X		X		
1442 N2					X		
1443						X	X
2501		X	X				
2520 B1		X	X		X		
2520 B2, B3					X		
2400	X	X	X	X	X	X	
2400 Dual Density	X	X	X	X	X	X	

Notes -

7-track tapes require Data Conversion feature No. 3228 or No. 3236 (except List). System Residence may be either 7- or 9-track. System Input and Systems Reader may be designated the same unit. Systems Input, Systems Punch and Systems List are required for systems generation and editing functions.

* Three (3) required.
** In the event that the 1052 is inoperative, printer devices may be assigned temporarily to SYSLOG.

The logical support of input/output file requirements for problem programs is provided as follows -

Problem Programs Compiled by TOS/360

Units	Assembler	RPG	COBOL	PL/I	FORTRAN
2540	X	X	X	X	X
1403	X	X	X	X	X
1404 continuous forms	X	X	X	X	X
1442	X	X	X	X	X
1443	X	X	X	X	X
1445	X	X	X	X	X
2501	X	X	X	X	X
2520	X	X	X	X	X
2400 (7- or 9-track)	X	X	X	X	X
2400 Dual Density	X	X	X	X	X
1052 Console (note 1)	X	X	X	X	X
2671	X				

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Note 1 - COBOL Accept and Display only... FORTRAN Output only... PL/I Display only.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... Attachment I - TOS/360 Restrictions... Attachment II - Retention of Supporting Documentation. SRL publications, appropriate to the component ordered, will be shipped, each has the title heading "IBM System/360 Tape Operating System."

Publication Name	Form No.
Assembler Specifications	C24-3414
Data Management Concepts	C24-3430
COBOL Language Specifications	C24-3433
Tape Sort/Merge Program Specifications	C24-3438
Autotest Specifications	C24-3441
Utility Program Specifications	C24-3465
System Generation and Maintenance	C24-5015
Performance Estimates	C24-5020
Operating Guide	C24-5021
COBOL Programmer's Guide	C24-5025
Concepts and Facilities	C24-5030
System Control and Service Programs	C24-5034
Supervisor and Input/Output Macros	C24-5035
Basic FORTRAN IV Programmer's Guide	C24-5038
Utility Macro Specifications	C24-5042
On Line Test Executive Program Specifications and Operating Guide	C24-5066
PL/I Programmers Guide	C24-9005
RPG Specifications	C26-3570
Basic FORTRAN IV Language	C28-6629
PL/I Subset Reference Manual	C28-8202

MACHINE READABLE - Option 1 - Appropriate material delivered for 6K Supervisor and is specified by using Program Number Extension OPT1. Option 2 - Appropriate material delivered for 8K Supervisor and is specified by using Program Number Extension OPT2. Components are as follows:

Program Title	Program Number	Program No. Extension
	360M	OPT1
Assembler	AS465	
COBOL	CB402	
System Control Program	CL405	
On-Line Test Executive Program	DN418	
FORTRAN IV	FO409	
Input/Output Control System	IO404	
Compiler Input/Output Modules	IO412	
Optical Character Reader	IO417	
PL/I	PL410	
Autotest	PT407	
RPG	RG408	
Sort/Merge	SM400	
Supervisor, 6K	SV413	
Utility Programs	UT403	
Multiprogramming Support Utility Macros	UT411	
	360M	OPT2
Assembler	AS465	
COBOL	CB402	
System Control Program	CL405	
On-Line Test Executive Program	DN418	
FORTRAN IV	FO409	
Input/Output Control System	IO404	
Compiler Input/Output Modules	IO412	
Optical Character Reader	IO417	
PL/I	PL410	
Autotest	PT407	
RPG	RG408	
Sort/Merge	SM400	
Supervisor, 8K	SV414	
Utility Programs	UT403	
Multiprogramming Support Utility Macros	UT411	

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Source modules delivered for the following components.

Program Title	Program Number	Program No. Extension
	360M	OPT1
System Control Program	CL405	
IOCS	IO404	
Assembler	AS465	
MPS Utility Macros	UT411	
	360M	OPT2
FORTRAN IV	FO409	
Sort/Merge	SM400	
Report Program Generator	RG408	
1285 Optical Character Reader	IO417	
	360M	OPT3
COBOL	CB402	
Autotest	PT407	
	360M	OPT4

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PL/I		PL410
CLTEP		DN418
	360M	OPT5
Utility Programs		UT403

ORDERING INFORMATION: SYSTEM NUMBER 360M

Note: Both basic and optional machine readable material for this system is ordered by specifying a "System Line" (Columns 1-7, 15-24) and "Component Lines" (Columns 8-12) of the Program Order Form. Enter a separate Component Line for each component desired. Respecify the system line for each different Program Number Extension.

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	OPT1	MT	9/800	28	01
		MT	9/1600	29	01
		MT	7DC/800	26	01
	OPT2	MT	9/800	28	01
		MT	9/1600	29	01
		MT	7DC 800	26	01
OPTIONAL	OPT1	MT	9/800	28	01
		MT	9/1600	29	01
	OPT2	MT	9/800	28	01
		MT	9/1600	29	01
	OPT3	MT	9/800	28	01
		MT	9/1600	29	01
	OPT4	MT	9/800	28	01
		MT	9/1600	29	01
	OPT5	MT	9/800	28	01
		MT	9/1600	29	01

360N *M

IBM SYSTEM/360 DISK OPERATING SYSTEM

DESCRIPTION - DOS/360 is designed in modular form to fit a wide range of System/360 configurations and applications for Models 25, 30, 40, 50 65 and 75, beginning at 16K bytes of main storage. A description of each component, functions and features, the program documentation, and ordering procedure follows. These should be used as guides for ordering the proper items to meet individual requirements.

SYSTEM CONTROL AND BASIC IOCS - 360N-CL-453

A prerequisite to any component in DOS/360. The program forms the nucleus of the system and provides the functions of system control, generation, and editing. Control Program input/output assignments are - System residence - system residence unit... system reader - unit used for job control cards... system input - main system input unit... system list - system printer unit... system punch - system output unit... system log - medium used for operator communication.

Ccntrol functions are as follows:

- Initial Program Loading - To initialize operation of the system.
- Supervisor - To provide main storage resident control functions in a minimum of 6,144 bytes. The size of the supervisor depends on the options specified at system generation time.

The configuration of control functions contained within 6,144 bytes is - Scheduling of I/O operations on the multiplexor channel and up to six selector channels... System loader for program fetching... Transient Area for functions such as - Error Recovery, File Management (Open, Close, End-of-Volume), End-of-Job, Checkpoint, Restart, Storage Print, Operator Communications via 1052... 7-Track Tape Handling... Physical I/O tables for 10 devices. As a minimum, at least 10 I/O devices and either Program Check Interrupt Exit or Channel Switching can be included within a 6,144 byte supervisor.

Note - Burst Mode on the multiplexor channel can be included in the minimum supervisor in lieu of selector channel scheduling. (Burst Mode is required if tapes are intermixed with byte interleave devices)..

Multiprogramming and/or BTAM Telecommunications and/or MICR processing will require, as a minimum, a System/360 configuration of 24K. The inclusion of either multiprogramming, Telecommunications, or MICR capability in the system will result in the generation of a supervisor greater than 6K regardless of the combination of other supervisory options that may be specified. The inclusion of the Storage Protection feature, which is required for multiprogramming, imposes a 2K boundary on the supervisor storage regardless of the actual storage utilized.

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A DOS/360 supervisor generated with any of the following options will require a minimum of 8,192 bytes -

- Multiprogramming.
- Telecommunications.
- DASD File Protection.
- 2311 System Input/Output.
- 2314 System Input/Output.
- 1259/1412/1419 MICR Processing.

The Interval Timer feature is optional and is conditioned only on the application requirements and the use of certain system macro facilities. No arbitrary requirement for the Interval Timer is imposed by DOS/360. For example, the Interval Timer is not required for the Telecommunications capability in DOS/360. It is, however, recommended in order to be able to take advantage of all systems facilities available with the Telecommunications capability. It is required when QTAM is used to support the 2740 Communication Terminal Model 2 with the Buffer Receiver feature (No. 1499).

A Telecommunications or MICR configuration, in addition to minimum storage requirements, must include one selector channel for at least the System Resident Device, since no Burst Mode device can co-exist with Telecommunications or MICR devices on the multiplexor channel. The amount of storage required for a Telecommunications application, in addition to the System Supervisor (8K bytes minimum), is dependent on the extent of the BTAM/QTAM facilities utilized and the size of the user determined areas and routines.

The minimum storage requirements for the BTAM modules are currently estimated to be - 3K bytes for Start-Stop devices... 8K bytes for Binary Synchronous devices... 11K bytes for both Start-Stop and Binary Synchronous devices. An estimated 2.5K bytes will be needed for the Communications Serviceability facilities in BTAM.

- Job Control - Brought into main storage by the supervisor to provide job-to-job transition, e.g., compile and execute... Symbolic Device Assignment within device dependent environment... Entry of additional information.

Generation and editing functions -

- System Generation - To initialize the System Residence, establish supervisor capabilities, and include desired system functions and processing programs.
- Librarian - Used for maintaining the libraries and providing printed and punched output from the Relocatable and Source Statement Libraries. Three libraries are used - Core Image Library, Relocatable Library, and Source Statement Library.
- A facility that allows the user to create and use private Source Statement and Relocatable Libraries has been added to the librarian. The number of private Relocatable Libraries that can be created is limited; however, only a single set of private libraries can be operative on the system at one time. Private relocatable and Source Statement Libraries may by used in combination with System Relocatable and Source Statement Libraries.
- CSERV is added as a librarian function. This allows the user to display and/or punch a specified phase or complete program from the Core Image Library. Subsequently, this phase or program can be cataloged (via the Linkage Editor) to the Core Image Library of another System Residence Pack containing the same size supervisor.
- Linkage Editor - For linking and relocating separate program sections from the Relocatable Library and/or from a system input unit; and editing into the Core Image Library for loading by System Loader.

Error Recording and Recovery Extensions - Outboard Recording, Statistical Data Recording, and Machine Check Recording and Recovery functions are now available as additional supervisor options.

MULTITASKING

Improved multiprogramming support (called multitasking) is offered to provide greater utilization of system resources at the partition level.

Multitasking includes the potential of executing up to 12 programs within the three DOS partitions. Each active partition must have a main program called main task. The main task can attach up to nine subprograms (called subtasks). Subtasks in each partition can be interrelated or independent programs. Communication between tasks within a partition is supported by means of new macro instructions. Other macros provide a means of protecting main storage (instructions and data) from simultaneous modification or use by more than one task within a partition.

Dual Density Support

When a standard label tape output file is opened, at load point, using a dual density tape drive, the density of the existing VOL1 label is checked. If it is not the same as

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that specified by the user, the labels will be re-written in the user-specified density, rather than that indicated in the label.

Forced End of Volume for Disk

Enables the user to force end of volume in sequential disk processing. This new support is comparable to the existing forced end of volume capability for tape. The following components support FEOVD: 360N-CL-453, SM-483, CB-482, UT-461, UT-462 and UT-463

ESTV (Error Statistics by Tape Volume) and EVA (Error Volume Analysis)

Two features for recording information about read and write errors for tape volumes are added. These features assist in monitoring the number of read and write errors on a tape volume. Remedial steps can be taken when tape volumes with excessive errors are encountered.

The ESTV feature collects error statistics in a table in the supervisor. The error records may be placed on a direct access device or printed on the console. A utility program is provided to dump the direct access records either to tape or a printer.

MINIMUM SYSTEM REQUIREMENTS - Unchanged.

BASIC INPUT/OUTPUT CONTROL SYSTEM (IOCS)

Logical IOCS is a set of routines and macro instructions that handle logical files of data for the user on the devices supported. Among these functions are -

- Request physical I/O operations to be performed when necessary.
- Block and deblock logical records within physical records.
- Provide label handling capabilities via OPEN/CLOSE/EOV routines.
- Switching between I/O areas when two areas are specified for a file.
- Overlapping reading/writing and processing operations.

The IOCS routines are tabular-modular type. The tabular-modular concept separates an IOCS input/output routine in two parts -

- The tabular section is a set of parameters describing the characteristics of the file.
- The modular section contains the logical module necessary to the I/O operation; these logical I/O modules may be preassembled and are incorporated in the problem-program at Linkage Editor time.

A single logic module may support more than one tabular section. Other features of IOCS are -

- Greater flexibility is provided in the assignment and control of system input and output files to facilitate and encourage concurrent peripheral operations.
- System input and output files on 2311 Disk Storage Drive.
- Self-relocating facilities.
- Automatic volume switching for system output files on magnetic tapes.
- Combined system output files on a single magnetic tape volume.
- Multiple program checkpoints on 2311 Disk Storage Drive.
- 7-track Checkpoint with Translate Mode Data on magnetic tape. (Data Conversion feature is required).
- DASD File Protection from errant input/output operations.
- Dual Density magnetic tape recording (800/1600 bpi).
- Enable/Disable Mode for the Universal Character Set (UCS).
- Error Recovery involving command chaining operations.
- Automatic retry of devices made ready following operator intervention type I/O errors.

** 2311-RESIDENT SUPERVISOR **
SUPERVISOR (6K), 360N-SV-474

** 2314-RESIDENT SUPERVISOR **
SUPERVISOR (8K), 360N-SV-486

The pregenerated supervisor, (6K or 8K), is contained in the Core Image Library when received by the requester. This will allow the user to use the machine components which are also in the Core Image Library without assembly or cataloging. See the description of System Control and Basic IOCS, 360N-CL-453 for description of the 6K and 8K configuration. See SRL C24-5033, IBM System/360 Disk Operating System, System Generation and Maintenance, for a description of the 6 and 8K Supervisors.

CONSECUTIVE DISK INPUT/OUTPUT CONTROL SYSTEM (IOCS) MACROS 360N-IO-455

Consecutive disk macros (GET/PUT) are used to sequentially process successive records in a logical file. DASD records are processed starting with a beginning DASD address and continuing in order through the records on successive

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tracks and cylinders to the ending address. The program may continue immediately following the GET/PUT macro before the input or output operation is completed. These macros Drive, a 2314 Direct Access Storage Facility, or a 2321 Data Cell Drive. Multitasking is supported.

CONSECUTIVE TAPE INPUT/OUTPUT CONTROL SYSTEM (IOCS) MACROS 360N-IO-456

Consecutive tape macros (GET/PUT) are used to sequentially process successive records in a logical file. Magnetic tape records are processed starting with the first record of a file through the end. Multitasking is supported.

Spanned Record Processing gives the capability and allows record processing without being concerned with the restrictions imposed by hardware on the length of a record. The sequential access method for Magnetic Tape allows a logical record, blocked or unblocked, to span multiple physical records.

DIRECT ACCESS METHOD MACROS - 360N-IO-454

Records within a logical file are organized on direct-access volumes in any manner chosen by the user. Storage or retrieval of a record (READ/WRITE) is by actual address or by relative address within a logical file. This address can be that of the desired record, of a starting point within the logical file where a search for the record begins. The starting point is based on a record key furnished by the user. The Direct Access Method macros are used for processing records organized in a random manner on a 2311 Disk Storage Drive, a Direct Address Storage Facility or a 2321 Data Cell Drive. Provision has been made for multiprogramming within a partition (Multitasking).

The capability to process variable length (FORMAT V) records have been added to the DOS Direct Access Method. All records are considered to be unblocked.

INDEXED SEQUENTIAL FILE MANAGEMENT SYSTEM MACROS 360N-IO-457

The Indexed Sequential File Management System (ISFMS) Macros permits DASD records to be processed in random order, or in sequential order by control information. For random processing, the user supplies the Key (control information) of the desired record to ISFMS, and issues a READ or WRITE macro instruction to transfer the specified record. For sequential processing by control information, ISFMS allows the user to construct data files by Key sequence in a manner that permits insertions (additions) without sorting, recopying, or merging. ISFMS can be used on a 2311 Disk Storage Drive, a 2314 Direct Access Storage Facility, or a 2321 Data Cell Drive. Multitasking is supported.
New features for ISFMS include the ability to store part or all of the cylinder index in core, and the ability to add new records to a prime data track by reading up to a full track into core, making the addition and rewriting the data. Both cylinder index in core and prime data in core are optional.

CONSECUTIVE PAPER TAPE INPUT/OUTPUT CONTROL SYSTEM (IOCS) MACROS - 360N-IO-458

Consecutive Paper Tape Macros are used for processing paper tape records, with or without translation of any code. A user may specify one or two I/O areas as desired, but work areas are not serviced. Two record formats are acceptable - Fixed-Unblocked (End-of-Record character prohibited)... Undefined (End-of-Record character mandatory).

BASIC TELECOMMUNICATIONS ACCESS METHOD - 360N-CQ-469

The BTAM facilities are designed chiefly to provide the tools to facilitate the writing of telecommunications programs. They may be used to design a dedicated telecommunications system. That is to say, the multiprogramming capability is not a prerequisite for BTAM. BTAM includes facilities for performing the following operations:

- Establishing, for switched networks, line connection with terminals by calling the terminals or by answering calls from the terminals.
- Polling and addressing terminals according to user established terminal lists, and changing the polling or addressing schemes at execution time.
- Transmitting and receiving messages and posting completion.
- Managing buffer pools.
- Posting completion of messages and notifying the problem program so that appropriate action may be taken.
- Providing the on-line terminal test facilities.
- Keeping error statistics.
- Retrying transmission errors, posting the conditions of non-recovered errors with error messages.

It is expected that, in an MPS system, the teleprocessing program will normally operate in a foreground partition that

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will include the BTAM module combined with the user's message processing routines. The user may employ any of the IOCS macros available in the system in designing his telecommunications application.

BTAM provides a multiple WAIT macro-instruction for use in telecommunications line operations only. This macro-instruction enables the telecommunications program to release control of the CPU until one or more of a series of events has occurred (such as the completion of BTAM READ or WRITE operation). Thus, it provides efficient concurrent operation of lower priority programs.

DEVICE SUPPORT - BTAM contains support for the 2972-8 General Banking System (using multi-point line control only) and Start/Stop support for the 2760 when attached to a 2740 (with the checking feature or the dial and checking features).

BTAM support for Binary Synchronous ID Verification has been expanded to include a multiple ID facility such that unique ID sequences can be received from remote binary synchronous stations. This expanded BTAM ID facility allows the central computer to communicate over the same switched line terminations, with BSC stations that do not allow ID verification as well as those that do. The facility will also permit use of ID sequences of variable lengths.

BTAM now has the capability of specifying general binary synchronous device classifications for the type of line connection (nonswitched point-to-point, switched point-to-point or nonswitched multipoint) for use in communicating with any supported type of remote binary synchronous device including the 2715 Transmission Control Unit, 2770 Data Communications Terminal and the 1800 Computing System. The support for the 2715 allows BTAM to intercept specially formatted messages and write the information in the message on the System/360 console or on the OBR/SDR recorder file.

The support for the 2715 includes new macros that generate tables to define the 2715 operation.

BTAM now provides the following added capabilities under binary synchronous on-line terminal test:

The capability of handling WACK responses from a terminal.

The capability of inserting component selection characters, received in the Request for Test message, into certain on-line test support for the 2770 Data Communications System.

Three additional stored transparent test messages have been added to provide the required transparent message formats for the 2780 output devices.

BINARY SYNCHRONOUS COMMUNICATIONS

BTAM support for Binary Synchronous Communications has been expanded to provide a greater degree of terminal compatibility and additional reliability features.

- All BSC terminals can have Identification (ID) capability. (This is a special feature on some terminals)
- Leading Graphics, WACK, and RVI control sequences have been added.
- All BSC terminals operate in ITB mode.

Improved reliability is provided by the following facilities:

- All BSC terminals except the 1130 and 2780 use double addressing to control multi-point lines.
- The first character of all ID sequences is duplicated.
- All BSC terminals will generate and check for a pad character following EOT and NAK.

These BSC improvements apply to the following supported devices:

- System/360 (Models 25, 30, 40, 50, 65, 67 (in 65 mode), and 75) with 2701 or 2703.
- System/360 Model 25 with Integrated Communications Attachment.
- System/360 Model 20 with BSCA using the BSCA IOCS program.
- 1130 with the Synchronous Communication Adapter using the Communication Subroutine.
- 2780 Transmission Terminal.
- 2792-8 General Banking Station.

BTAM has been extended to compile error statistics via the Outboard Recorder (OBR) and the Statistical Data Recorder (SDR). OBR/SDR statistics are available for all BTAM supported devices except the 2826/1017/1018 paper tape devices.

The support of Binary Synchronous Communcation combined with that of the various start-stop devices gives BTAM a wide range of applications and flexibility. This programming package supports low and high speed devices in one access method. Also included within this support are the 2701/2703 Error Recovery Procedures and Error counts.

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BTAM supports Binary Synchronous Communication over non-switched (leased or private direct connection) and switched (dial) networks in a CPU-to-CPU and CPU-to-2780 and CPU-to-1130 communication. The basic line control functions that are provided for are:

System/360 Model 25, 30, 40, 50, 65, 67(65 mode), 75 to:

	System/360*	2780	1130	360/20
Contention (pt to pt)	X	X	X	X
Headers	X		X	X
Normal text	X	X	X	X
Inquiry and alternating replies	X	X	X	X
WABT (optional)	X			
Transparent Text	X	X	X	X
Dial Auto Answer	X	X	X	X
Dial with Identification	X			X
Disconnect	X	X	X	X
EBCDIC Code	X	X	X	X
USASCII Code	X	X		
Transcode (6-bit)		X		X
Multipoint (centralized)		X	X	X
Intermediate Block Checking		X		X
Conversational	X			X

*Model(25, 30, 40, 50, 65, 67 (65 mode) or 75 with BSC.

QUEUED TELECOMMUNICATIONS ACCESS METHOD - 360N-CQ-470

QTAM is a generalized input/output control system that extends the techniques of logical IOCS to the telecommunications environment. In addition to the standard GET/PUT macro instructions support for message processing programs, QTAM provides high-level and flexible message control language. Some of the capabilities provided by QTAM through the use of macro instructions are: automatic control of switched networks...polling terminals...receiving and editing messages from terminals...addressing terminals... sending and editing messages to terminals...dynamic buffer management...queueing messages on a direct access storage device.

A telecommunications system built upon QTAM facilities consists of:

1. A message control program (Foreground 1) to control the flow of message traffic from one remote terminal to another (message switching application) and between remote terminals and any message processing programs (message processing application message).

2. Message processing programs (Foreground 2 and/or Background) to perform the message processing required by the users application.

QTAM allows a synchronous operation of all partitions of the system. This method of execution is based on the completion of queued events and on the established priorities of Foreground 1, Foreground 2, and Background.

Communication Serviceability Facilities-(BTAM and QTAM)

Communications Serviceability Facilities are incorporated within BTAM and QTAM. They are provided on an optional basis in BTAM.

It is strongly recommended that all systems include these facilities because they provide status information and assist in the maintenance of the system by the customer engineer, and thereby provide better systems availability to the customer.

The Communication Serviceability Features are:

- Error Recovery Procedures (BTAM and QTAM) - These are provided on a line basis. The operation in error if retried twice on non-BSC devices and three times (or a user specified number of times) on BSC devices. If the error persists, the conditions of the error are posted and a system-to-operator message describing the error is printed on the printer/keyboard.

- Job termination and a printout are provided on certain non-recoverable errors.

- Diagnostic Write/Read Commands (2701 only) are performed to isolate non-recoverable errors either to the control unit or to an external source.

- Error Counts (BTAM and QTAM)- Counts are maintained for errors on a line basis. These error counts will be printed on the printer-keyboard when any error rate is excessive. An additional facility enables the users program to cause error statistics from cumulative counters to be printed at the printer-keyboard. Error counts are not provided for the 2260 Display Station (Local) by BTAM or QTAM or for the 7770/7772 Audio Response Units by BTAM.

- On-Line Terminal Test (BTAM and QTAM)- Terminal test procedures will operate on-line with the user problem program, and will not impact user operation other than

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the time required tc perform their function. Test can be requested from a terminal and returned to that terminal or any other terminal on the same system. Tests are not provided for Teletype Terminals or the terminals associated with the 7770/7772 Audio Response units the 2260 Display Station (Local), or BSC devices.

- Operator Control (QTAM) - Operator control is provided as an option to enable the operatcr to examine and modify QTAM control information and to respond to errors and unusual condition. An IBM 1050 system, or IBM 2740 Communication Terminal with station control and checking, is required for this function. When operator control facilities are used, operator awareness messages may be directed to the operator control terminal instead of the printer-keyboard.

- Checkpoint/Restart (QTAM)- Checkpoint/Restart is provided for the QTAM message ccntrol program as an optional facility. The terminal table queue control blocks, and the polling lists are checkpointed on the disk at the user specified intervals. Two checkpoint records are maintained with a pointer to the most current record. Restart will be accomplished by reloading the QTAM message ccntrcl program, using the latest checkpoint records to overlay the initial queue control blocks and polling lists.

QTAM has been expanded to include error recording facilities via the Outboard Recorder (OBR) and the Statistical Data Recorder (SDR). OBR/SDR is not supported for audio devices.

The timer interrupt support has been changed to eliminate the requirement to have at least one line group with a zero polling interval specified.

1402/1440/1460 EMULATOR PROGRAM UNDER DCS/360

COMPATIBILITY SUPPORT/30 (CS/30) 360N-EU-484
COMPATABILITY SUPPORT/40 (CS/40) 360N-EU-485

Allows the user to run 1401/1440/1460 programs under the Disk Operating System in conjunction with following machine features:

Model 25 - 1400 Series Compatibility (#1440) and 1401/1440/1460 DOS Compatibility (#4470) using CS/30.
Model 30 - 1401/1440/1460 Basic Compatibility Feature (#4456) and Programmed Mode Switch (#5856).
Model 40 - 1401/1440/1460 DOS Compatibility Feature (#4460)

This allows 1400 programs to be run in a stacked-job environment mixed with System/360 jobs. All initialization required by the Basic Compatibility Features are handled by the emulatcr programs except for disk. Initialization and clearing of disk packs is performed by options in the DOS/360 Initialize Disk utility program and in the DOS/360 Clear Disk utility program. All of the 1400 CPU instructions are executed by the compatibility features except the Move Character and Edit (MCE) and Move Character and Suppress Zeros (MCS) instructions, which are executed by a macro in the CS/40 program. The emulator programs use the physical IOCS capabilities of the Disk Operating System to simulate the 1400 I/O instructions. In addition, when the 1400 end-of-job halt is recognized, the emulator programs call DOS Job Control to provide transition to the next job. 1400 error conditions may be trapped automatically to the operator to allow operator intervention or an abnormal end of job with a 1400-style main storage dump, followed by a release to end of job.

There are three main levels of support for the emulator programs. They are:

- 1400 Unit Record: Support for 1400 card programs and for reading and punching both BCD and binary data is provided
- 1400 Tape: Support is provided for 1400 tape operations under the emulatcr program. This support enhances the performance of 1400 original equipment and requires no reprogramming of 1400 programs written consistent with 1400 SRL manuals published by IBM.
- 1400 Disk: Support is provided for 1311 Disk Storage Drives and 1301 and 1405 Disk Storages. Disk Programming support offers full upward and downward compatibility between the CS/30 under DOS and the Model CS/40 under DOS. Upward disk compatibility is provided between Models 25/30/40 stand-alone emulation and the Model 30/40 emulator programs under DOS.

In a multiprogramming environment the emulator program must be run as a background program. To utilize this feature efficiently, it may be desirable to assign SYSRDR and SYSIPT (the combination known as SYSIN) to a magnetic-tape unit or disk extent. If SYSIN is assigned to a magnetic-tape or disk unit, that device must input all of the control cards that normally are included in the job stream.

SYSIPT, SYSLST, and SYSPCH can be either sequential or split-cylinder in organization. Other forms of disk organization are not supported.

The assignment of SYSIN to a magnetic tape or disk for the background program also makes the card reader available to

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read the control cards and data cards for a foreground program. This has the effect of reducing the number of statments entered by the operator from the console typewriter.

Most 1400 unit-record output (card and printer) can be produced through concurrent peripheral operations by assigning the card punch SYSPCH and/or the printer SYSLST to either a magnetic tape or disk.

The following are system requirements configuration for CS/30 on the Model 25:

- System/360 Model 25 with a 2025 Processing Unit containing at least 24,576 (24K) bytes of Program Storage
- 1400 Series Compatibility Feature (#4440) and 1401/1440/1460 DOS Compatibility (#4770)
- Storage Protection Feature (#7520) for Multiprogramming
- One card reader (1442, 2520,2540,2560 with 2540 Emulation cr Control Feature (see note 3)
- One card punch (1442, 2520 or 2540) (see note 3)
- One printer (1403, 1404 or 1443) (see note 3)
- One 1052 Printer Keyboard
- Integrated 2311 Attachment (#4598) for attaching up to four 2311 Disk Storage Drives Model 1...includes File Scan Capability
- One 2311 Disk Storage Drive for DOS System Residence
- Whatever systems configuration is required for operation of the user's Disk Operating System.

The following are system requirements configuration for CS/30 on the Model 30.

- System/360 Model 30 with a 2030 Processing Unit containing 24,576 (24K) bytes of storage (the amount of actual storage is variable, depending on the features of the CS/30 program and the features of the Disk Operating System that are included in the program).
- 1401/1440/1460 Basic Compatibility Feature (#4456)
- Programmed Mode Switch Feature (#5856)
- Decimal Arithmetic Feature (#3237)
- Storage Protection Special Feature (#7520) for multiprogramming
- File Scan Feature (#4835) (supported, but not required)
- I/O Compatibility Features
- Standard Instruction Set (see Note 1)
- One I/O channel (either multiplexor or selector) (see Note 2)
- One card reader (1442, 2501, 2520, or 2540) (see Note 3)
- One printer (1403, 1404, or 1443) (see Note 3)
- One 1052 Printer-Keyboard
- 1051 Attachment (#7915)
- 1051 Control Unit with CPU Attachment (#3130)
- One 2311 Disk Storage Drive or 2314 Direct Access Storage Facility for DOS System Residence
- Whatever systems ccnfiguration is required for operation of the user's Disk Operating System

The following are system requirements for a minimum Model 40 configuration for the emulator program:

- System/360 Model 40 with a 2040 Processing Unit containing 32,768 (32K) bytes of main storage
- 1401/1460 Compatibility Feature (#4457) and 1311 Disk Compatibility Feature (#9710) (see Note 4)
- File Scan Feature (#4385) (supported but not required)
- 1401/1440/1460 DOS Compatibility Feature (4460) (see Note 4)
- Decimal Arithmetic Feature (#3237)
- Storage Protection Special Feature (#7520) for multiprogramming
- Standard Instruction Set (see Note 1)
- One I/O channel (either multiplexor or selector) (see Note 2)
- One card reader (1442, 2501, 2520, or 2540) (see Note 3)
- One card punch (1442, 2520, or 2540) (see Note 3
- One 1052 Printer-Keyboard
- 1052 Adapter (#7920)
- One 2311 Disk Storage Drive or 2314 Direct Access Storage Facility for DOS System Residence

--Whatever systems configuration is required for operation of the user's Disk Operating System

Note 1: System/360 language translators may require extended instructions sets.

Note 2: System/360 telecommunications require a multiplexer channel and at least one selector channel.

Note 3: One 2400-Series Magnetic Tape Unit (7 or 9 track) may be substituted for this device. (If SYSIPT, SYSPCH, or SYSLST are assigned to 7 track tape units, the Data Conversion Feature is required).

Note 4: When the 1401/1440/1460 DOS Compatibility Feature 4460 is installed, the operation of the Model 40 emulator program 360C-EU-074 is excluded on the system.

Once the minimum configuration requirements are met, the configuration may range froma card-oriented System/360 Model 25/30/40 to a maximum configuration of disk, tape, and teleprocessing. Tape and teleprocessing are mutually exclusive on the Model 25 under DOS.

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One of the objectives of CS/30, CS/40 is to provide flexibility of external devices for the user who needs to grow and requires system availability to do so. 1400 programs operating under the CS/30, CS/40 can request I/O operations on the following System/360 devices:

- 1442, 2520, 2540 Card Read Punch, or 2501 Card Reader
- 1403 (for continuous-forms operations), 1404 (for continuous-forms and cut-card operations) or 1443 Printer
- 1052 Printer-Keyboard (for operator communications)
- 2311 Disk Storage Drive or 2314 Direct Access Storage Facility
- 2400-Series Magnetic Tape Units (and Controls)

Input/output device correspondence between a 1401, 1440, or 1460 system and a System/360 Model 25/30/40 is as follows:

1401/1440/1460 I/O Device	System/360 I/O Device
1402 or 1442* Card Read Punch or 1444 Card Punch	2501 Card Reader or 1442, 2520, or 2540 Card Read Punch*
1403, 1404***, or 1443 Printer	1403, 1404***, or 144 Printer
729, 7330, or 7335 Magnetic Tape Unit	2400-Series Magnetic Tape Unit(and Control
1407 Console Inquiry Station or 1447 Console	1052 Printer-Keyboard
1301 or 1405 Disk Storage or 1311 Disk Storage Drive	2311 Disk Storage Drive or 2314 Direct Access storage Facility

* 1442 reading and punching into the same card can be simulated by the punch unit on the 2540 (if the PFR feature is installed), by the 1442 Model N1, or by the 2520 Model B1.

*** The 1404 Printer should be used if cut-card operations are to be simulated; otherwise, 1403 or 1443 should be used.

Additional features supported by CS/30, CS/40 are:

- Timer Feature
- Simultaneous Read-While-Write Tape Control (2404 or 2804)
- Any channel configuration up to one multiplexer channel and two selector channels.
- Tape Switching Unit (2816)
- Universal Character Set
- Multiple Character Set (on 2025)

Input/output feature correspondence between a 1401, 1440, or 1460 system and a System/360 Model 25/30/40 is as follows:

1401/1440/1460 I/O Feature	System/360 I/O Feature
1402 Punch Feed Read and Control Unit (5890 and 5895)	2540 Punch Feed Read (5890); Punch Feed Read Control (5895) on the 2821 Control Unit* or on the Integrated 2540 Attachment (4595) on 2025
Column Binary Feature (1990) Binary Transfer (1468)	Column Binary Feature (1990) must be installed on the 2821 Contrcl Unit (standard on Integrated 2540 Attachment (4595) on 2025
Card Image Feature (1531)	Card Image Feature (1532
1402 51-Column Interchangeable Read Feed (4150) and Feed Adapter (1013)	2540 51-Column Interchangeable Read Feed (4151)**
1403 Preferred Character Set (5523) and Adapter (5524) 1416 Interchangeable Train Cartridge equipped with Preferred Character Set Print Chain	1403 Universal Character Set*** for Model 2 (8641 or Model N1 (8640) with prerequisite Interchangeable Train Cartridge and appropriate Universal Character Set Adapter and the 2821 Control Unit or 1403 Multiple Character Set *** (5110 on Model 2, 5111 on Model N1) with Multiple Character Set Adapter (5100) on Integrated 1403 Attachment (4590) on 2025
Scan Disk (6396)	File Scan (4385) must be installed on the 2841 Storage Control Unit (standard on Integrated 2311 Attachment (4598) on 2025

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* If stacker selection of punch-feed-read cards is to be simulated, 2540 Compatibility Attachment (8065) must be installed on the 2821 Control Unit not required on Integrated 2540 Attachment (4595) on 2025.

** When this feature is installed, reading speed is permanently reduced from 1000 cpm to 800 cpm.

*** With this feature, printing speed is dependent upon the number of characters in the character set and if unprintable characters are included in the print line.

The CS/30, under DOS in conjunction with the 1401/1440/1460 Basic Compatibility Features (4456) on Model 30 or 1401/1440 /1460 DOS Compatibility Feature (4470) on Model 25 provide support for all 1401, 1440, and 1460 standard operations and instructions, CS/40 with the 1401/1440/1460 DOS Compatibility Feature (4460) provides support for all the basic 1401/1460 features, and the following special features (for those items followed by an asterisk, refer to the list of I/O feature correspondence):

- Advanced Programming (1060) for the 1401
- Bit Test (1470)
- Column Binary (1990)*
- Binary Transfer (1468) for the 1460*
- Expanded Print Edit (3835) (CS/30)
- 51-Column Interchangeable Read Feed (4150)*
- High-Low-Equal Compare (4575)
- Multiply-Divide (5275)
- Print Storage (5585)
- Additional Print Control (5540)
- Punch-Feed-Read (5890)
- Space Suppression (7426)
- Sense Switches (7600)
- Scan Disk (6396)
- Direct Seek (3281, 3282, 3283) for the 1311
- Track Record (8011) for the 1311
- Indexing and Storage Address Register (4631) for the 1460
- Processing Overlap (5730) (CS/40

Note: Processing Overlap is not available as such, but overlap is provided by the emulator program for tape, disk, and 1400 unit record devices.

The following units and features, supported by DOS/360 are not supported by the CS/30, CS/40 programs: 1445 Printer... 2671 Paper Tape Reader...2321 Data Cell Drive...1285 and 1287 Optical Readers...1259, 1412, and 1419 Magnetic Character Readers...7770 and 7772 Audio Response Units... Selector Tape Listing Features (1403) for continous paper tape...Teleprocessing Devices.

Note: The 1259, 1412, and 1419 Magnetic Character Readers require special consideration if utilized while the emulator program is operating.
Input/Output devices required for the operation of DOS.

DOS FORTRAN IV - 360N-FO-479
DOS FORTRAN IV LIBRARY SUBPROGRAMS - 360N-LM-480

This FORTRAN IV Compiler provides language features beyond DOS Basic FORTRAN IV. The additional features are:

- Data initialization statements.
- COMPLEX and LOGICAL data types.
- The logical IF statement
- END and ERR parameters to allow testing for end-of-file and error conditions on input.
- ASSIGN and assigned GO TO statements.
- Labeled COMMON.

DOS FORTRAN IV is fully compatible with and encompasses USA Standard FORTRAN IV. Extensions beyond the USA Standard language level include:

- Direct access input/output statements for the IBM 2311 and 2314 Direct Access Storage Devices.
- Seven dimensions for arrays.
- An IMPLICIT statement allowing extended implicit classification by the first character of a name.
- The NAMELIST statement permitting input/output and conversion without an explicit I/O list and FORMAT statement.
- The PAUSE statement option allowing output of messages to the console typewriter.
- Generalized subscripts.
- Multiple entry points to subprograms.
- Non-standard RETURNs from SUBROUTINEs.
- Combine object modules with those produced by BASIC FORTRAN IV.
- Compile approximately 250 source statements in the minimum 40K bytes of main storage.
- Automatically expand to use additional main storage, as available, to compile larger programs.
- Produce optional pseudo-assembly listings of compiler output.
- Simultaneously use the LINK and DECK options.
- Overlay phases at object time.
- Accept Explicit BCD or EBCDIC character codes.

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- Support batched compilation (i.e., the ability to compile multiple programs without reinvoking the compiler).

DOS FORTRAN IV requires a background of at least 40K bytes for compilation.

COMPILER INPUT/OUTPUT MODULES - 360N-IO-476

These Input/Output modules used by PL/I, COBOL and RPG object programs are pre-assembled and incorporated into the Relocatable Library. They provide all necessary input/output operations so that the user can execute programs written in Basic PL/I, COBOL and/or RPG without having to generate input/output routines.

MICR IOCS - 360N-IO-477

The MICR (Magnetic Ink Character Recognition) IOCS is used to read data from and control the engage, disengage, stacker select and other control functions of the 1259, 1275, 1412, and 1419 Character Readers. By means of external interrupt, the DOS Supervisor provides the user with the ability to perform stacker selection on a first priority basis, regardless of the partition in which the problem program is operating. Following stacker selection, logical IOCS enables the user to access documents sequentially, process the data, and exercise control over non-MICR and non-OCR input/output devices. This normal processing (as opposed to stacker selection) partition in which the problem program is executed.

The supervisor and logical IOCS support up to six (6) Character Readers, which may operate in any combination in any or all partitions. The engage, disengage, document reading, and stacker selection functions are performed through macros. A buffer is maintained to provide the problem program with continuous input data. The External Interrupt capability is employed to provide an automatic entry to the user's stacker select routine on a first priority basis regardless of the partition in which the routine resides. GET macro logic is provided for the user's processing requirements other than stacker selection: This normal processing takes the priority of the partition in which the program is executed. When higher priority (Non-MICR and Non-OCR) partitions are operative, reduced document throughput may occur, however, the higher priority program is interrupted to perform stacker selection and fill the MICR for OCR input buffer.

The following units are supported by MICR IOCS:
- 1275 Optical Reader Sorter Models 2 and 4
- 1412 Magnetic Character Reader with System/360 Adapter feature (#7720). Engineering Change level, EC 131182, required.
- 1419 Magnetic Character Reader (Model 1) with System/360 Single Address Adapter feature (#7720). Engineering Change level EC 131182 required.
- 1419 Magnetic Character Reader (Model 1) with System/360 Dual Address Adapter feature (#7730). Engineering level, EC 131196 required.
- 1403 Printer with the Selective Tape Listing feature (#6410 on Model 3 or N1, #6411 on Model 2, #6420 on Model N1).
- All 1275 1412/1419 special features are supported.

NOTE: 24K bytes of storage and either the Direct Control feature (#3274) or the External Interrupt feature (#3895) (System/360 Model 30) are required.

The following configuration and system design considerations are applicable to DOS/360 MICR or OCR environment:
- Up to six (6) Magnetic Character Readers are supported. The maximum number that may be effectively operated is application and configuration dependent.
- Unique System Supervisors are generated for (a) 1412/1419 with the Single Address Adapter feature (#7720) and (b) 1419 with the Dual Address Adapter feature (#7730); or 1275 Model 2 or 4 therefore concurrent operation of the two features is precluded.
- When Magnetic Character Readers are utilized on the multiplexer channel, magnetic tape or direct access devices may not operate on the multiplexer channel.

OPTICAL CHARACTER READER IOCS - 360N-IO-478

Optical Character Reader IOCS provides support for IBM 1285 and 1287 Optical Readers which read tapes such as those produced on cash registers and adding machines, directly into the system. The 1285 and 1287 are now supported in a multiprogramming environment under DOS/360.

The IOCS also provides support for reading printed and hand printed numeric data and optical Mark-Read data from cut form documents such as sales checks, utility stubs and customer orders (1287 and 1288 Optical Readers).

Optical character reader support can be utilized in a multiprogramming environment under DOS/360 for processing documents or printed paper tapes. Factors affecting optical character reader performance under DOS/360 that must be considered are -

- System/360 model.

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- Number of readers (maximum of 8 are supported).
- Characteristics of tapes and/or documents.
- Batch or multiprogramming environment.
- If processing printed paper tapes, the blocking of input data.
- Users programming.

In addition, throughput is dependent on operator loading and unloading time. This handling time is significant when processing short printed paper tape rolls.

DOS TAPE AND DISK SORT/MERGE PROGRAM - 360N-SM-483

The Dos Tape and Disk Sort/Merge provides support for the 2314 Direct Access Storage Facility. In addition to the features provided by the other DOS sort/merge programs, this program provides the following facilities: The sort user may read, modify, or insert tape/disk records by means of Exit 15, and may write or delete tape/disk records by means of Exit 35...A tag sort may be requested for DASD...Tape and disk control cards are compatible...The sort may operate in either the background or a batched-job foreground partition. ..User exits have additional capability.

This sort/merge program enables the user to sort files of unsequenced records into one sequential file. The control data information can be read from as many as 12 fields in each record. The program assumes that input records for a sort operation are in random sequence. However, if an inherent sequencing exists, the program takes advantate of it.

Records can be sorted or merged into ascending or descending sequence, and an individual sequence can be specified for each control-data field. The output sequence for a merge-only operation must be the same as the input sequence.

MINIMUM SYSTEM REQUIREMENTS - A 16K partition for 2311 and 2400 sorts, and a 22K partition for 2314 sorts.

This sort is designed to be tailored at system generation time to meet the specific requirements of the customer installation. The following facilities can be included at system generation:

- The entire Sort/Merge Library
- The entire Sort Library
- The entire Merge Library
- A 2400 Sort Library
- A 2311 Sort Library
- A 2314 Sort Library

MULTIPROGRAMMING SUPPORT UTILITY MACROS - 360N-UT-471

These macros provide the user of DOS/360 with a direct and easy means of generating efficient file-to-file utility programs tailored to his specific needs. The generated utility programs are designed to operate as foreground programs within the multiprogramming environment of DOS/360, but can also operate as background programs. These macros may be combined with user programs to produce either generalized or specific file processing programs. The MPS Utility Macros are capable of residing on the 2314 and may use that facility as an I/O device for the OUTDISK and INDISK macros.

These macros will produce self-relocating object code which will provide input/output control functions such as -

- Opening and closing files, including label processing.
- Blocking/Deblocking of fixed length records.
- Printer forms and Stacker Selection control.
- User exits before, during, and upon completion of record processing.

DOS/360 UTILITIES

The DOS/360 Utilities have been divided into three groups in order to simplify ordering and maintenance. Each group is itemized and described below. The following features are available in most of the programs -

- Moving and copying a logical file or part of a logical file from one volume to another.
- Moving a logical file from one location to another on the same volume.
- Printing and/or punching a logical file.
- Field selecting, blocking, and deblocking of records.
- Computing I/O area assignments based on available storage space and the size of the input and output blocks. Maximum advantage of device and Process Overlap for a given block size is taken.
- Label checking.
- Skipping a number of input records before processing begins.

Group 1 Utilities (360N-UT-461) is a prerequisite for using Group 2 and/or Group 3.

The DOS/360 Utility Support includes support for the IBM 2314 Direct Access Storage Facility in those programs supporting the IBM 2311 Disk Storage Drive. This additional support requires an additional parameter on the Utility

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Modifier card. In addition, new special purpose programs have been provided for both the IBM 2311 and the IBM 2314. All DOS utility programs may reside on or use the IBM 2314 for system input/output files. The utilities will be distributed for operation in the Background partition, but may be linkage edited by the user to operate in a batched job Foreground partition.

GROUP 1 (UNIT RECORD AND DISK) UTILITIES - 360N-UT-461

- Card to Printer and/or Punch - Transfers binary or EBCDIC data from cards to a printer and/or a card punch.
- Data Display - Prints all of the block.
- Data List - Prints one line for each data record.
- Card to Disk - Transfers binary or EBCDIC data from cards to disk, with or without key fields.
- Disk to Card - Transfers data from disk to cards. The disk file may or may not have Key fields. Data may be punched in either EBCDIC or binary.
- Disk to Printer - Prints a disk file in one of two formats.
- Data Display - Prints all of a disk block.
- Data List - Prints one line for each data record.
- Disk to Disk - Transfers the data from one disk file to another. The input and/or output file may or may not have Key fields.
- Clear Disk - Clears one or more areas of 2311 or 2314 Disk Storage, and establishes pre-formatted tracks containing an indicated base throughput the area cleared.
- Initialize Disk - Performs the functions of BPS/360 16K Initialize Disk (2311/2314), 360P-UT-206. It prepares a complete disk pack for use on the IBM 2311 or IBM 2314.
- Alternate Track Assignment - This program assigns an alternate track to a defective track or changes from defective to nondefective the flag indicating the track's condition. Provision has been made to allow the replacement or insertion of one, or more records during the transfer of data to the alternate track.
- Copy Disk to Card and Restore Card to Disk - These programs permit the user to transfer a file or a volume of data from disk to cards, and to restore that data to a disk pack at a later date. The restored records occupy areas of the disk pack identical to the original file. Consecutive, Indexed Sequential, and Direct Access methods of file organization are supported with a Copy Volume feature but Indexed Sequential and Direct Access Methods are not supported with a Copy File feature.

 Both the Copy and the Restore programs write Checkpoint records enabling them to be restarted at the end of a new EXTENT or after processing 80 tracks of an EXTENT. The Checkpoint file may be assigned to either disk or to tape. An additional option permits copying IPL records during a Copy File job.

 The output created by the Copy program is designed for use by the DOS Restore program only.
- Copy and Restore Disk to Disk - This program performs the same function as the Copy/Restore Disk to Card programs without the intermediate storage medium.
- VTOC Display - Provides the means of displaying the individual labels in the Volume Table of Contents from either a system pack or a data pack. The labels are identified by location within the VTOC and their format, type, and major fields are indicated by appropriate heading lines.

GROUP 2 (MAGNETIC TAPE) UTILITIES - 360N-UT-462

- Tape to Printer - Prints a tape file in one of two formats.
- Data Display - Prints all of a tape block.
- Data List - Prints one line for each data record.
- Card to Tape - Transfers binary or EBCDIC data from cards to magnetic tape.
- Tape to Card - Transfers data from magnetic tape to cards. Data may be punched in either EBCDIC or binary.
- Disk to Tape - Transfers data from a disk file to a tape file. The disk file may or may not have Key fields.
- Tape to Disk - Transfers data from a tape file to a disk file. The disk file may or may not have Key fields.
- Tape to Tape - Transfers the data from one tape to another.
- Data Cell to Tape - Transfers data from a data cell file to a tape file. The data cell file may or may not have Key fields.
- Tape to Data Cell - Transfers data from a tape file to a data cell file. The data cell file may or may not have Key fields.
- Tape Compare - Compares two files from two or more tapes to ensure that the files are identical.
- Copy and Restore Disk to Tape - These programs perform the same functions as the Copy/Restore Disk to Card programs but substitute tape as the intermediate storage medium.

GROUP 3 (DATA CELL) UTILITIES - 360N-UT-463

- Data Cell to Printer - Prints a data cell file in one of two formats.
- Data Display - Prints all of a data cell block.
- Data List - Prints one line for each data record.
- Disk to Data Cell - Transfers data from a disk file to

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 a data cell file. The input and/or output file may or may not have Key fields.
- Data Cell to Disk - Transfers data from a data cell file to a disk file. The input and/or output file may or may not have Key fields.
- Data Cell to Data Cell - Transfers the data from one data cell file to another. The input and/or output file may or may not have Key fields.
- Clear Data Cell - Clears one or more areas of 2321 data cell storage, and establishes preformatted tracks containing an indicated base throughout the area cleared.
- Alternate Track Assignment - This program assigns an alternate track to a defective track, or changes from defective to nondefective the flag indicating the track's condition. Provision has been made to allow the replacement or insertion of one or more records during the transfer of data to the alternate track.

VOCABULARY FILE UTILITY - 360N-UT-472

This program provides for the creation and updating of an Audio Vocabulary file. The customer receives the Input Vocabulary file containing words in digitally coded form on either punched cards or magnetic tape. The program allows the user to select the words he needs, by means of control statements from this file and to organize them on disk (2311 and 2314) in the manner best suited to his application. The program also provides the ability to list the Input Vocabulary file and the Operating Vocabulary file created by the user.

TAPE SORT/MERGE - 360N-SM-480

The Sort Program enables the user to sort files of unsequenced tape records into one sequential file. The Merge program enables the user to merge (collate) up to seven presorted tape files into one file. Significant features of Tape Sort/Merge are -

- Sorting or merging on as many as twelve control-data fields.
- Collating sequences and data format can be specified separately for each control field.
- Records can be sorted or merged into ascending or descending sequence.
- The sort employs IOCS standard label checking or enables the user to bypass or process his non-standard labels.
- The Checkpoint-Restart facility permits the user to interrupt and continue during the merging phases of the sort.
- Magnetic tapes are used as work files.
- An alternate work drive is available during sort and will allow the maximum input file size to be approximately doubled.

DISK SORT/MERGE - 360N-SM-450

The Disk Sort program enables the user to sort files of unsequenced disk (2311) or tape records into one sequential file. The Merge program enables the user to merge (collate) up to four pre-sorted disk or tape files into one file. The program assumes that input records for a sort operation are in random sequence. Records can be sorted or merged into ascending or descending sequence. The output sequence for a Merge-only operation must be the same as the input sequence. Significant features of the sort/merge are -

- Sorting or merging on as many as twelve control-data fields.
- Collating sequences and data format can be specified separately for each control field.
- Option of writing an output file on disk composed of the disk addresses or disk-addresses-plus-control-data for the sorted records.
- Provides exits to storage areas for user-written routines.
- Sorts multiple input files.
- Input and output can be from either tape or disk.
- Disk intermediate storage may be designated on the system residence device assuming sufficient working storage is available.
- Disk storage is used as work areas.

AUTOTEST - 360N-PT-459

Autotest is a debugging aid for object programs assembled by the Assembler and executed under DOS/360. It monitors the execution of the program under test and has the following facilities -

- Creation of input data by means of standard utility programs.
- Exchange, addition or deletion of instruction without reassembly.
- Dump any portion(s) of main storage, permanent storage assignments, general registers and/or floating point registers whenever a designated address is reached during program execution. The main storage dump can be in Hexadecimal, Character, Floating Point, Fixed Point, or mnemonic representation.
- Dump of main storage at normal or abnormal End of Job in Hexadecimal, Character, and/or mnemonic representation. Source symbols can also be printed with the End-of-Job

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dump.
- List of all phases in sequence of calling.
- Point of any output file.

Autotest runs in the background partition only with all other partitions reduced to zero. (Autotest does not support the IBM 2314 Direct Access Storage Facility.)

ON-LINE TEST EXECUTIVE PROGRAM (OLTEP) - 360N-DN-481

OLTEP, together with associated on-line unit tests, allows testing of System/360 I/O devices while operating under control of the DOS/360 supervisor. OLTEP is a monitor program that controls the execution of individual routines designed to test specific I/O units. OLTEP can be run either in a dedicated batch-only environment or in the background partition of a multiprogramming system. The latter allows the user in a multiprogramming environment to continue performing productive work in the foreground during the running of I/O unit tests. Except for specific I/O units being tested, all units of the system remain available to the user.

Some of the advantages of OLTEP are:

. Increased system availability.
. Improved serviceability.
. Productive work (in Foreground partitions) during servicing.
. Systems checkout following maintenance.

OLTEP may reside on and use the IBM 2311 or 2314 for system input/output files.

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ASSEMBLER D - 360N-AS-465

Assembler Language is a symbolic programming language used to write programs for the System/360. The DOS/360 assembler program processes the language, provides auxiliary functions useful in the preparation and documentation of a program, and includes facilities for processing macro instructions. Included in the language are the standard and optional instruction sets, mnemonics, extended mnemonics, literals, and macro facilities.

Assembler provides the following new or improved functions for DOS users:

- 2314 support - Provides 2314 support for all I/O files for which there is DOS system support.
- Concurrent deck and link options (14K variant only).
- Blocked link file for improved linkage editor performance (14K variant).
- Private library support allowing users to maintain and access private source statement libraries (14K variant only).
- Improved performance.

At system generation time, the user has the option to generate variations of the assembler using:

- Three 2311 or 2314 disk storage extents as work files, using 10K bytes of main storage.
- Three 2400-series magnetic tape units (either 7-track or 9-track) as work files, using 10K bytes of main storage. The data conversion feature is required for 7-track operation.
- 14K bytes of main storage. This variation of the assembler permits the user to select at execution time three 2311 or 2314 disk storage extents or three 2400 - series magnetic tape units as work files (mixed). Disk storage extents may be on the same device that contains the DOS/360 system residence.
- Provides punch error recovery procedures.
- Provides support for multivolume system output.

- Provides support for a 2311 or 2314 as SYSIN, SYSLST, SYSPCH (using 14K bytes of main storage).

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ASSEMBLER F - 360N-AS-466

A high performance assembler implementing the full System/360 Assembler Language (except for CXD, DXD, and type 0 DC's which have no significance under DOS). It provides new and improved functions for users with a minimum of 64K of main storage. These functions include -

- High performance - Up to 45 percent faster than the present DOS/360 supported assembler, Assembler D (360N-AS-465).
- Up to two continuous cards per statement, rather than one.
- Multiple-operand DC and DS statements.
- Bit-length modifiers, in addition to byte-length modifiers, in DC and DS statements.
- Enhanced diagnostic capability.

Any source program that can be assembled by Assembler D (360N-AS-465) can be assembled by Assembler F without change. Assembler F requires a minimum of 44K bytes of main storage and executes in the background partition only.

REPORT PROGRAM GENERATOR (RPG) - 360N-RG-460

DOS/360 RPG is a powerful, high level, problem oriented language capable of generating programs that range from producing simple reports to full file maintenance. The generated programs will read data from punched cards, tape and disk; update records according to user specifications; write output records on tape and disk; punch cards and prepare printed reports. RPG offers a rapid method of converting defined applications to operational programs producing results. With minimal specifications, RPG generated programs can -

- Obtain data records from single or multiple input files.
- Perform record identification.
- Sequence check input files.
- Determine logical order of record processing.
- Perform calculations on data taken from input records or literals.
- Perform automatic decimal alignment.
- Perform test and/or comparisons which may influence processing.
- Exit to user subroutines written in a language other than in RPG.
- Produce reports with unlimited number of heading and detail up to nine levels of total plus an End-of-Job total.
- Support the 2321 Data Cell Drive as storage for user data files.
- Provide generation of programs to create and add records to Indexed Sequential files on the 2311, 2314 and 2321 Direct Access Storage Devices support. Data files created on the 2321 may optionally have high level indices located on a disk volume.
- Provide the ability to process information within the Key field of Indexed Sequential records where the Key is not part of the data portion of the record.
- Assign two input/output areas to sequential files on card, tape, disk, or data cell if enough main storage is available.
- Bypass the retrieval of a record if the desired record is in main storage from a previous request. This applies to records retrieved by key from direct access or Indexed Sequential files by chaining or Record Address File (RAF) processing.
- Allow multivolume unlabeled tape input.
- Allow externally conditioned indicators to be specified to control the execution of the program.

In addition, RPG has the capabilities of processing the following World Trade requirements -

- Automatic handling of sterling fields.
- Alternate collating purposes.
- Inverted field in editing.

RPG requires the Standard Instruction Set and Decimal Arithmetic feature No. 3237.

COBOL - 360N-CB-452

COBOL (Common Business Oriented Language) is similar to English. COBOL provides a convenient method of coding programs to handle commercial data processing problems. DOS/360 COBOL provides important new features that reduce the cost of programming and extend the use of the language to new areas of application.

Among the new features furnished by the COBOL compiler are:

- Floating point facility.
- Debugging source statements.
- Debugging packets that may be compiled together with the source program and executed at object time without alterations to the original source program.
- Subprogram facility.
- Copy and Include from a users source program library.
- Improved object code efficiency.
- Improved object program execution time.

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- Improved perform performance.
- DASD statements handled by the COBOL compiler for 2311 Disk Storage Drive, 2314 Direct Access Storage Facility, and 2321 Data Cell Drive. These are -

 . For Indexed Sequential - Load, Add, Retrieve, Retrieve and Update.
 . For Direct Access - Sequential Build, Retrieve, Retrieve and Update.
 . Sequential processing for 2321 Data Cell Drive.
 . Use after Error Clause handled for utility and direct access files.
 . Apply Write-Only clause handled.
 . Inverted Print Edit.

A COBOL library consists of subroutines called by the compiler to perfcrm conversions, complex arithmetic operations, and certain I/O functions.

COBOL requires the Standard Instruction Set and the Decimal Arithmetic feature No. 3237. The Floating Point Arithmetic feature No. 4427 is also required if Floating Point literals, data items or non-integer exponents are used. The COBOL Compiler design point is 14K of core storage. For this reason a 24K system is required for compilation of COBOL programs.

COBOL DASD MACROS - 360N-CB-468

These macros enable a user of DOS/360 COBOL to access the 2311 Disk Storage Drive by using Indexed Sequential or Direct Access IOCS. The following functions are provided:

- For Indexed Sequential - Load, Sequential and/or Random Retrieval, Random Retrieval and Add.
- For Direct Access - Load, Sequential and/or Random Retrieval.

These macros are assembled using the DOS/360 Assembler and are link-edited with the object program produced by the COBOL Compiler.

USA STANDARD COBOL - 360N-CB-482

The DOS USA Standard COBOL Compiler complies with the approved USA Standard COBOL Language (x3.23 1968 COBOL) and incorporates IBM extensions. The USA Standard COBOL Language is the result of a standardization effort of the United States of America Standards Institute using CODASYL COBOL, Edition 1965, as a base. The language complies with the first draft ISO recommendation for COBOL.

The Sort, Report Writer, and Segmentation modules represent a totally new capability for the user of COBOL under DOS/360

SORT... The Sort feature permits the COBOL programmer to request execution of a sorting operation within his program. Records may be summarized, inserted, deleted, shortened, or otherwise altered during the initial and final phases of the sort.

SEGMENTATION... Large problem programs can be split up into segments and those segments which are overlayable can be so designated. This allows for more efficient use of core storage at object time.

REPORT WRITER... This feature permits the program to use COBOL Language statements to specify the format of a written report.

SPANNED RECORD FACILITY

COBOL has implemented the BLOCK CONTAINS clause for the specific case where logical record size is greater than physical record size for direct access data sets (both random and sequential), and sequential data sets for magnetic tape.

RELATIVE TRACK ADDRESSING FACILITY

Allows the accessing of records according to the track they reside on relative to the first track allocated to the file.

In addition to the features defined in the language standard the following IBM extensions are provided in this compiler:

. Indexed Sequential Access Method
. Cross Reference listing
. Condensed Listing Option
. Data/Procedure Map Separation
. Both SYSLNK and SYSPCH output
. Special Registers for Time-of-Day, Date, I/O error codes, and SORT feature flexibility
. Internal and External Floating Point Items
. Internal Decimal Items
. Linkage Section of the DATA DIVISION TRANSFORM statement
. Debugging Language including DEBUG, TRACE, ON, and EXHIBIT

MINIMUM SYSTEM REQUIREMENTS - The USA Standard COBOL compiler under DOS requires a partition size of at least 55,296 bytes of main storage. Extensive Report Writer utilization may require the allocation of additional main storage.

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In addition to the features required for the operation of the Disk Operating System, the following features are required for the USA Standard COBOL compiler:

. The Commercial Instruction Set
. The Floating Point feature (if Floating Point literals or calculations are used)
. Four utility work files on 2400-Series Magnetic Tape Units, 2311 Disk Storage Drives, or a 2314 Direct Access Storage Facility. At least one of these work files must be on a 2311 or 2314 Direct Access Storage Device.

All devices supported by DOS COBOL (360N-CB-452) are supported by the USA Standard COBOL compiler.

COBOL TO USA STANDARD COBOL LANGUAGE CONVERSION- 360N-CV-489

The Language Conversion Processor (LCP) converts DOS COBOL D source programs into USA Standard COBOL source programs suitable for compilation by the USA Standard COBOL compiler under DOS. This LCP operates as a problem program under DOS.

The differences between the USA Standard COBOL Language and the S/360 COBOL Language are largely syntactical and the conversion process is primarily concerned with changing the format of selected COBOL statements. Because this process is mainly a routine clerical task, the LCP is provided to ease the conversion effort, reduce conversion costs, and minimize user involvement in the conversion.

Input-- The input to the LCP must be a DOS/360 COBOL D source program which adheres to the COBOL D specification and compiles and executes correctly under DOS COBOL D.

Output-- A listing is produced which identifies all changes made to the original source program and flags statements requiring verification or manual conversion. A converted source program may optionally be produced as output.

The amount of conversion is relative to the extent of use of COBOL D elements that differ in specification from the corresponding USA Standard COBOL elements. The LCP handles a majority of the items that must be considered when converting; of the remainder, those items which require manual conversion are flagged with a warning message, the rest (which represent minor differences in processing in USA Standard COBOL rather than syntactical language differences) are unchanged.

MINIMUM SYSTEM REQUIREMENTS - The LCP requires a minimum partition size of 18K bytes of main storage. In addition to the requirements of DOS, the Commercial Instruction Set is required for the execution of the Language Conversion Processor.

FORTRAN IV - 360N-FO-451

The FORTRAN IV Language is especially useful in writing programs for scientific and engineering applications that involve mathematical computations. The DOS/360 FORTRAN IV Language is compatible with and encompasses the American Standards Association (ASA) Basic FORTRAN, including its Mathematical Subroutine provisions.

DOS/360 FORTRAN IV offers the following advanced features - Mixed-Mode... Spacing Format... Literal Format Code... The A Format Code... Scale Factor... Carriage Control... Double Precision Data Type... Three Dimension Arrays... Functional subprograms may return results via the argument list.

The FORTRAN IV Compiler now offers the following features:

- Input/Output device support for the IBM 2314 Direct Access Storage Facility.
- Compiler output decks may now be executed in a batched job foreground partition.

The FORTRAN IV Compiler allows the introduction of source programs in either BCD or EBCDIC character codes. The FORTRAN IV compiler and object programs require the Standard Instruction Set and the Floating Point feature No. 4427.

PL/I - 360N-PL-464

The Basic PL/I Compiler provides, in a single high-level language, many new and significant features, such as -

- Comprehensive data conversion and editing facilities.
- Data structures for alphameric information.
- Ability to process a wide range of data types, including character and bit strings, fixed and floating decimal, and fixed and floating binary.
- Both structured data and array data have arithmetic capability, including expressions whose elements are simple variables, structured data, and arrays.
- Data stream transmission.
- Record transmission capability.
- Batched Job Foreground execution capability for compiler output decks.
- Object time performance is improved through the elimination of repetitive transient fetches.

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- CATALR cards are now produced by the compiler for object modules if UPSI bit 0 is on.
- Sterling Picture capability now includes PICTURE characters 6, 7, and 8.
- Source statement numbers now appear in the object code listing.

Basic PL/I provides the user with a key for solving both computing and resource allocation problems. It enables the user to employ an organization of programmers using one common language, thus reducing training cost and enhancing communication between scientific and commercial applications groups.

The PL/I source program may employ a set of DASD macros (360N-CB-468) that enables the DOS user to access the 2311 Disk Storage Drive by using Indexed Sequential IOCS Macros.

MINIMUM SYSTEM REQUIREMENTS - 16,384 bytes of main storage for batch job processing*...24,576 bytes of main storage for 2311 or 2314 system input/output,MICR, multiprogramming, and/or BTAM...65,536 bytes of main storage for QTAM... Standard Instruction Set***...storage protection feature (required for multiprogramming...one I/O channel (either multiplexer or selector)***...one card reader (1442,2501, 2520, or 2540)****...one printer (1403, 1404, or 1443****... one 1052 Printer-Keyboard...one 2311 Disk Storage Drive or one 2314 Direct Access Storage Facility.

* The COBOL compiler design point is 14K. For this reason 24K bytes are required.

** RPG and COBOL require the Decimal Arithmetic feature (#3237). FORTRAN requires the Floating Point feature. (#4427). The Floating Point feature (#4427) is also required in COBOL if floating point literals, data items, or non-integer exponents are used.

*** Telecommunications and MICR IOCS require a multiplexer channel and at least one selector channel, and the 2314 requires a selector channel.

**** One 2400-Series magnetic tape drive may be substituted for each device. If 7-track drives are used, the Data Conversion feature (#3228 or #3236) is required except when a tape is substituted for a printer.

Systems Generation utilizes the Assembler to perform functions and therfore requires three (3) logical files for working storage. If sufficient working storage is not available on the systems resident unit, either a second 2311 Disk Storage Drive or three (3) 2400 Magnetic Tape Units will be required. It is recommended that a multiple disk or disk/tape system be used.

The following features and I/O devices are supported by the DOS/360 - Interval Timer... Simultaneous Read-While-Write Tape Control (2404 or 2804)... One multiplexor channel and up to six selector channels... Storage Protection feature (required for Multiprogramming)... Additional main storage up to a System/360 Model J... Universal Character Set... External Interrupt of Direct Control (as used with 1259, 1412 or 1419 only), 1259, 1412 and 1419 Magnetic Character Readers... 1442 Card Read Punch... 1442 Card Punch... 2501 Card Reader... 2520 Card Punch... 2520 Card Read Punch... 2540 Card Read Punch... 1403 Printer... 1404 Printer (for continuous forms only)... 1443 Printer... 1445 Printer... 1052 Printer-Keyboard (used for operator communications)... 2311 Disk Storage Drive... 2314 Direct Access Storage Facility... 1285 Optical Reader... 2321 Data Cell Drive... 2401, 2402, 2403, 2404 and 2415 Magnetic Tape Units... 2671 Paper Tape Reader... 2816 Tape Switching Unit... 1287 Optical Reader.

The DOS/360 BTAM facilities support the following control units, features, and terminals - 2701 Data Adapter Unit with AUTO CALL (No. 1302, No. 1303) feature... 2702 Transmission Control Unit with features - AUTO CALL Adapter (No. 1290), 1032 Attachment (No. 7918), Autopoll (No. 1319)... 2703 Transmission Control Unit with Autopoll, and AUTO CALL Adapter (No. 1315) feature... 2740 Communication Terminal... 7770/7772 Audio Response Units... 2260 Display (local) Station.

The following terminals can be attached by means of a private, leased, or common-carrier network to the multiplexor channel through a 2701, 2702 or 2703 Control Unit - 1030 Data Collection System... 1050 Data Communication System... 1060 Data Communication System... 2260 Low Cost Display (remote) (2701 only with 2848 Control Unit)... AT&T 83B3 Selective Calling Stations... AT&T

DOS-USA Standard COBOL Language	C28-6394
DOS-USA Standard COBOL Programmer's Guide	C28-6398
Conversion Programs	C28-6400

Teletypewriter Terminal Models 33 and 35... Western Union Plan 115A Outstations. The following configuration and system design considerations are applicable to the DOS/360 telecommunication environment -

- All telecommunication devices must be on the multiplexor channel and no Burst Mode devices may coexist on the channel.

CONTINUED FROM PRIOR COLUMN

- All terminals on a line must be of the same type. The terminals may be mixed within the same problem program.

CONTROL PROGRAM INPUT/OUTPUT - DOS/360

Units Supported	Residence	Reader	Input	Work*	Punch	List	Log**
1052							X
2540		X	X		X		
1403						X	X
1404						X	X
1442 N1		X	X		X		
1442 N2					X		
1443						X	X
2501		X	X				
2520 B1		X	X		X		
2520 B2, B3					X		
2311, 2314	X	X	X	X	X	X	
2400 Dual Dens.		X	X	X	X	X	

* 2311 or 2314 is required for control program working storage, i.e., Compile and Go, Linkage Editor.

** In the event the 1052 is inoperative, printer devices may be temporarily assigned to SYSLOG.

2400 may be used for working storage only by language processors (3 required). 7-track tapes require Data Conversion feature (except LIST). Work devices may not be mixed between disk and tape.

The logical support of input/output file requirements for problem programs is provided as follows -

PROBLEM PROGRAMS COMPILED BY DOS/360

Units	Assembler	RPG	COBOL	PL/I	FORTRAN
2540	X	X	X	X	X
1403	X	X	X	X	X
1404 Continuous Forms	X	X	X	X	X
1442 N1 and N2	X	X	X	X	X
1443	X	X	X	X	X
1445	X	X	X	X	X
2501	X	X	X	X	X
2520 B1, B2 and B3	X	X	X	X	X
2400 (7- or 9-track)	X	X	X	X	X
2400 Dual Density	X	X	X	X	X
2311 Consecutive Org.	X	X	X	X	X
2311 Direct Access Org.	X	X	X	X	X
2311 Indexed Seq. Org.	X	X	X		
2321 Consecutive Org.	X		X		
2321 Direct Access Org.	X		X		
2321 Indexed Seq. Org.	X		X		
1052 Console (Note 1)	X		X	X	X
2671	X				
2260 Local	X				
2701, 2702, 2703 with 1030, 1050, 1060, 2740, 2260 (2701 only), and teletype terminals (WU 115A, AT&T 83B3 and models 33/35) 2848-2260 (Remote)	X				
2701, 2703 Binary Synchronous and 2780	X				
7770/72, 2848-2260 (Local)	X				
1285	X				
1287	X				
1412	X				
1419	X				
2314 Consecutive Org.	X	X	X		X
2314 Direct Access Org.	X	X	X		X
2314 Indexed Seq. Org.	X	X	X		X

S/360 Model 25 via ICA with:
1030, 1050, 1060, 2740 Models 1 and 2, Teletype Terminals (WU 115A), AT&T 83B3, AT&T Models 33/35, 2760 Optical Image unit attached to 2740 Model 1, 2780, 1130 and S/360 Model 20

Note 1 - COBOL Accept and Display only, FORTRAN output only, PL/I Display only.

Language	System Requires	Object Program May Use
Basic	Standard Instruction Set	Standard Instruction Set
FORTRAN IV	Floating Point option	Floating Point option
Basic PL/I	Standard Instruction Set	Universal Instruc. Set
COBOL	Standard Instruction Set	Universal Instruc. Set
	Decimal Arithmetic option*	Standard Instruction Set Decimal Arithmetic opt.
RPG	Standard Instruction Set	Standard Instruc. Set
	Decimal Arithmetic opt.	Decimal Arithmetic opt.

* Floating Point option is required if floating point literals and/or non-integer exponents are used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - The following SRL publications and

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informal documentation, appropriate to the components ordered, will be shipped by PID with each initial order of the Disk Operating System:

Publication Name	Form No.
FORTRAN IV Programmer's Guide	C28-6397
FORTRAN IV Language	C28-6515
FORTRAN IV Library Sub-programs	C28-6596
Tape and Disk Sort/Merge	C28-6676
1401/40/60 Emulators for S/360 Models 30 & 40	C28-6940
Assembler Specifications	C24-3414
Data Management Concepts	C24-3427
COBOL Language Specifications	C24-3433
Tape Sort/Merge Program Specifications	C24-3438
Sort/Merge Program Specifications	C24-3444
Utility Programs Specifications	C24-3465
Operating Guide	C24-5022
COBOL Programmer's Guide	C24-5025
Concepts and Facilities	C24-5030
Performance Estimates	C24-5032
System Generation and Maintenance	C24-5033
System Control and Service Programs	C24-5036
Supervisor and Input/Output Macros	C24-5037
Autotest Specifications	C24-5062
OLTEP Specifications and Operating Guide	C24-5066
Operator Communications and Messages	C24-5074
PL/I Programmer's Guide	C24-9005
RPG Specifications	C26-3570
Vocabulary File Utility for 7772 ARU	C27-6924
FORTRAN IV Language	C28-6629
Basic PL/I Reference Manual	C28-8202
Basic Telecommunications Access Method	C30-5001
QTAM Message Processing Program Services	C30-5003
QTAM Message Control Program	C30-5004
DOS-USA Standard COBOL Language	C28-6394
DOS-USA Standard COBOL Programmer's Guide	C28-6398
COBOL to USA Standard COBOL Language LCP	C28-6400
FORTRAN IV Programmer's Guide	C24-5038
COBOL DASD Macros	C24-5039
Utility Macro Specifications	C24-5042
PL/I DASD Macros	C24-5059

MACHINE READABLE - Appropriate material is distributed for the 2311 Resident System and the 2314 Resident System by specifying one of the program number extensions described below:

1. 2311 users who do not require either the Model 40 Emulator or ANS COBOL should specify Program Number Extension 2311.
2. 2311 users who do not require either the Model 40 Emulator or ANS COBOL should specify Program Number Extension 2311A.
3. 2311 users who do not order the Model 40 Emulator or ANS COBOL originally, but require it sometime in the future should specify Program Number Extension 2311B.
4. The 2314 user should specify Program Number Extension 2314.

Following is a list of available DOS/360 components, their component numbers, and Program Number Extensions.

Program Title	Program Number	Program No. Extension
	360N	2311
	360N	2311
Assembler D	AS465	
Assembler F	AS466	
COBOL	CB452	
COBOL DASD Macros	CB468	
System Control and Basic IOCS	CL453	
BTAM	CQ469	
QTAM	CQ470	
Model 30 Emulator	EU484	
Basic FORTRAN IV	FO451	
FORTRAN IV	FO479	
Direct Access Method	IO454	
Consecutive Disk IOCS	IO455	
Consecutive Tape IOCS	IO456	
ISFMS	IO457	
Consecutive Paper Tape IOCS	IO458	
Compiler I/O Modules	IO476	
MICR IOCS	IO477	
FORTRAN IV Library Sub-program	LM480	
PL/I	PL464	
Autotest	PT459	
RPG	RG460	
Tape Sort/Merge	SM400	
Disk Sort/Merge	SM450	
Tape/Disk Sort/Merge	SM483	
2311 Supervisor (6K)	SV474	
Group 1 Utilities	UT461	
Group 2 Utilities	UT462	
Group 3 Utilities	UT463	
MPS Utility Macros	UT471	
Vocabulary File Utility for 7772	UT472	

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OLTEP	DN481	
Model 40 Emulator	EU485	
USA Standard COBOL	CB482	
Language Conversion Program	CV489	
Optical Character Reader IOCS	IO478	
	360N	2314
Assembler D	AS465	
Assembler F	AS466	
COBOL	CB452	
COBOL DASD Macros	CB468	
System Control and Basic IOCS	CL453	
BTAM	CQ469	
QTAM	CQ470	
Model 30 Emulator	EU484	
Basic FORTRAN IV	FO451	
Direct Access Method	IO454	
Consecutive Disk IOCS	IO455	
Consecutive Tape IOCS	IO456	
ISFMS	IO457	
Consecutive Paper Tape IOCS	IO458	
Compiler I/O Modules	IO476	
MICR IOCS	IO477	
Optical Character Reader IOCS	IO478	
FORTRAN IV Library Sub-program	LM480	
PL/I	PL464	
Autotest	PT459	
RPG	RG460	
Tape Sort/Merge	SM400	
Disk Sort/Merge	SM450	
Tape/Disk Sort/Merge	SM483	
2314 Supervisor (8K)	SV486	
Group 1 Utilities	UT461	
Group 2 Utilities	UT462	
Group 3 Utilities	UT463	
MPS Utility Macros	UT471	
Vocabulary File Utility for 7772	UT472	
OLTEP	DN481	
Model 40 Emulator	EU485	
USA Standard COBOL	CB482	
Language Conversion Program	CV489	

OPTIONAL PROGRAM PACKAGE

DOCUMENTATION - Optional Program Material List.

MACHINE READABLE - Source coded material is available as follows:

Program Title	Program Number	Program No. Extension
	360N	VOL1
System Control	CL453	
	360N	VOL2
Assembler D	AS465	
Assembler F	AS466	
	360N	VOL3
Group 1 Utilities	UT461	
Group 2 Utilities	UT462	
Group 3 Utilities	UT463	
MPS Utility Macros	UT471	
	360N	VOL4
COBOL	CB452	
USA STANDARD COBOL	CB482	
Language Conversion Program	CV489	
	360N	VOL5
Tape and Disk Sort/Merge	SM483	
	360N	VOL6
Autotest	PT459	
Report Program Generator	RG460	
	360N	VOL7
BTAM	CQ469	
Vocabulary File Utility	UT472	
QTAM	CQ470	
	360N	VOL8
Basic PL/I (continued on VOL12)	PL464	
	360N	VOL9
Basic IOCS	CL453	
Optical Character Reader IOCS	IO478	
Magnetic Character Reader IOCS	I0477	
	360N	VOL10
OLTEP	DN481	
Tape Sort/Merge	SM400	
Disk Sort/Merge	SM450	
	360N	VOL11
Basic FORTRAN IV	FO451	
FORTRAN IV	FO479	
FORTRAN IV Subroutines	LM480	
	360N	VOL12
PL/I (continuation of VOL8)	PL464	
	360N	VOL13
USA Standard COBOL (continued	CB482	

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from VOL4)

ORDERING INFORMATION: PROGRAM NUMBER 360N

NOTE: Both basic and optional machine readable material for this system is ordered by specifying a "System Line" (columns 1-7, 15-24) and "Component Lines" (columns 8-12) of the Program Order Form. Enter a separate Component Line for each component desired. Respecify the System Line for each different Program Number Extension.

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	2311	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	02
	2311A	MT	7DC/800	26	02
		MT	9/800	28	01
		MT	9/1600	29	01
		DISK	1316	52	03
	2311B	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		DISK	1316	52	01
	2314	MT	7DC/800	26	02
		MT	9/800	28	01
		MT	9/1600	29	01
		DISK	2316	57	01
OPTIONAL	VOL1	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL2	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL3	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL4	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL5	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL6	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL7	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL8	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL9	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL10	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL11	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL12	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01
		1316		52	01
	VOL13	MT	7DC/800	26	01
		MT	9/800	28	01
		MT	9/1600	29	01

360P-AS-021
SYSTEM/360 BASIC ASSEMBLER

DESCRIPTION - The Basic Assembler is a two-phase, one-for-one Assembly program which translates source programs written in the System/360 Basic Assembler Language into machine language object programs. This output is in relocatable deck format and can be loaded with either the Absolute or the Relocating Loaders provided with the Basic Utility programs. A program listing with error indicators is also provided. If available, from one to five magnetic tape units may be utilized to speed the assembly process.

MINIMUM SYSTEM REQUIREMENTS - Standard S/360 Instruction Set... 8K main storage... 2540 or 1442 Card Read/Punch or 2501 Card Reader and the 2520 Card Punch and/or Card Reader Punch... 1403 or 1443 Printer (optional)... 1052 Printer Keyboard (optional)... One to five 2400 Series Tape Units (optional).

Note - The Basic Card Assembler does not contain punch error recovery capability for the 2520.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-AS-091
BPS BASIC TAPE SYSTEM (8K)

DESCRIPTION - The Basic Tape System consists of the 8K Tape Assembler and the 8K Tape IOCS/System Control and Synchronous Transmitter/Receiver macros. The STR macros provide dial and leased line programming support for System/360 Models 30, 40, 50, 65 and 75 with 2701 Data Adapter Unit and Synchronous Data Adapter Type I (Nos. 7695 and 7696), communicating with the following STR devices:

- S/360 Mod 20 with the Communication Adapter, feature No. 2073.
- S/360 Model 30, 40, 50, 65 and 75 with a 2701 Adapter Unit equipped with the Synchronous Data Adapter Type I (SDA-I).
- 1009 Data Transmission Unit... 1013 Card Transmission Terminal... 7701 Magnetic Tape Transmission Terminal... 702 Magnetic Tape Transmission Terminal... 7711 Data Communication Unit... 1974 Model 2 Data Transmission Terminal (RPQ unit)... 1978 Models 1, 2 and 3 Print-Read-Punch Terminal (RPQ unit).

Punch error recovery for the 1442 and 2540 is also provided by this program and 800/1600 bpi Dual Density feature is supported. All tape files presently recorded in 800 bpi can be run without alteration on drives having the dual density feature.

MINIMUM SYSTEM REQUIREMENTS An 8K System/360, Model 30 with -- Three 2400 series Magnetic Tape Units (one must be 9-track)... one 2540, (one 2501 Card Reader, a 2671 Paper Tape Reader) or 1442 Card Reader or 2520 Card Read/Punch Model B1 or card punch models B2 and/or B3... One 1403, 1404, or 1443 printer... one I/O channel (Either multiplex or selector)... Standard Instruction Set... 2701 Data Adapter Unit with SDA-I (No. 7695 and No. 7696)... At least one of the following - 2401 or 2402 Magnetic Tape Unit, Model 4, 5, or 6, and 2803 or 2804 Tape Control, Model 2... 2403 Magnetic Tape Unit and Control, Model 4, 5 or 6... 2415 Magnetic Tape Unit and Control, Model 4, 5 or 6.

The IBM 1285 Optical Reader, which is used to read printed paper tapes directly into the system. Up to eight units can be attached. A byte multiplexing function is included that permits the interleaving of the 1285 with other I/O devices that operate in the byte mode. Up to twelve devices (for example - 1442 Card Read/Punch, 2501 Card Reader or additional 1285 Optical Readers) may operate in this mode.

Most STR applications will probably require 16K, however, utility type applications requiring minimum processing and code conversion are supported in an 8K environment.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-FO-031
BPS FORTRAN TAPE SYSTEM

DESCRIPTION - BPS/360 FORTRAN (Tape) System comprises a compiler (including library subroutines), a loader, and an editor.

Tape Compiler - The compiler is an eight-phase program

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which translates programs written in the FORTRAN IV Language into relocatable object programs. A source program listing along with error indicators and a storage map of the variables, external references, and constants are provided on request. A compile-and-go feature is provided. The job to be performed may consist of source program(s), previously compiled object program(s), or a combination of the two, also provided are control card capabilities which enable the user to change device assignments at edit, compile, or object time.

Loader - The FORTRAN Loader is a two-phase relocating loader that can load separately compiled programs into storage and complete the linkages between them. This loader will also load input acceptable to the BPS/360 Basic Utilities Relocating Loader (360P-UT-020).

Editor - The FORTRAN Editor enables library subroutines to be deleted, added, or changed, as well as proprietary changes to the Compiler and Editor itself.

MINIMUM SYSTEM REQUIREMENTS - A System/360 with a Scientific Instruction Set and 16K or more bytes of main storage and the following minimum I/O units - One or any combination of the following devices that provides for card reading and punching: 1442 Card Read/Punch, 2501 Card Reader, 2520 Card Read/Punch, 2520 Card Punch, 2540 Card Read/Punch... 1403 or 1443 Printer... Three 2400 series Magnetic Tape Units, either 9-track or 7-track with the Data Conversion and 7-track Compatibility features... an optional 2400 series Magnetic Tape Unit for compile-and-go... an optional 1052 Printer Keyboard.

Machine Configuration

	SYSIN	Punch	Print	Compiler Work Files	Go File	Object Program Work Files
2501	X					X
2520	X	X				X
2540	X	X				X
1442	X	X				X
1403			X			X
1443			X			X
1052			X			X
2400	X	X	X	X	X	X

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360 Package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-FO-205
BPS FORTRAN-IV (16K-CARD)

DESCRIPTION - System/360 BPS FORTRAN IV (16K card), consists of a Compilation system, an Execution system and a FORTRAN Library.

Compilation System -- A twelve-phase program which translates a source program written in System/360 FORTRAN IV Language into a relocatable object program. A source program listing is provided on request along with error indications and a list of external references. Error recovery procedures are provided for reading, printing, and punching.

Execution System -- Can load separately compiled programs into storage and complete the linkages between them. The system will also load any input acceptable to the BPS/360 Basic Utilities Relocating Loader (360P-UT-020). Large jobs which exceed available core may be broken into segments and loaded sequentially into the same core area... information is passed between the segments through common storage, which is preserved. Also provided are control card capabilities which enable the user to change device assignments at object time, as well as error recovery procedures for reading, printing, and punching.

Library -- The routines provided are - FDXPD... FDXPI... FIXPI... FTXPI... FTXPR... EXIT... ALOG, ALOG 10... SQRT... ATAN... TANH... EXP... COS, SIN... DUMP, PDUM... DLOG, DLOG 10... DSQRT... DATAN... DTANH... DCOS, DSIN... DEXP... MOD... AMOD, DMOD... MAXO, MINO, AMAXO, AMINO... MAX1, MIN1,AMAX1, AMIN1... DMAX1, DMIN1... FLOAT, DFLOAT... IFIX, INT, IDINT... AINT... SLITE, SLITET... OVERFL... DVCHK... IBCOM, NIBCOM... DIM, IDIM... SIGN, ISIGN... SNGL... DBLE... ABS, IABS, DABS.

MINIMUM SYSTEM REQUIREMENTS - A 16K System/360 with the following minimum I/O devices for compilation of source programs -One 1442 Card Read/Punch or 2540 Card Read/Punch or 2520 Card Read/Punch. One 1443 Printer or 1403 Printer. A 1052 Printer-Keyboard is optional. In addition, the Floating Point Arithmetic feature is required for the execution of object programs.

Notes: This program is part of the IBM System/360 Basic

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Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to these sections following the last "360P" program abstract.

360P-IO-058
IBM SYSTEM/360 BPS INPUT/OUTPUT 1412/1419

DESCRIPTION - The program provides for banking applications the use of one 1412 attached to a S/360 Model 30 or one or two 1419's attached to a S/360 Model 30, 40, 50 or 65. The program can control the input and output functions that are associated with such typical MICR processing as Demand Deposit Capture, Outgoing Transit and Proof of Deposit. The program has these functions - Engaging and disdengaging the MICR readers... reading MICR documents... batch numbering.

Maintenance of a document input buffer(s)... presenting data for user processing including field validity indicators... control of I/O commands for all supported devices and appropriate error routines... servicing in interrupts... System/360 standard tape label or 2311 Disk label processing. With the I/O program the user can insert his routines for such functions as - stacker determination... formatting of printer output, punch output, and magnetic tape or disk output... document arithmetic processing... Recognition of control levers... multiplex capability which provides four request queues which will permit 4 unbuffered byte mode I/O devices to operate in a data interleaved mode on the multiplex channel. The 1412 and 1419's have their own queues and are interleaved in addition to the four request queues. If any burst mode operations are attempted on a multiplex channel queue, I/O operations which can be multiplexed on the remaining queues will be processed prior to the burst mode operation.

The expanded multiple program facility provided will permit control of up to four user programs concurrently. These four programs, referred to as a user's program set can contain (a) One 1412 or 1419 program and up to three additional user programs... or (b) two 1419 programs and up to two additional user programs... or (c) one to four user programs which do not include 1412 or 1419 input. A user program set once loaded must complete processing of all programs within that set prior to loading a new program set. Maintains maximum MICR Reader-Printer thruput. Thruput speeds will vary with document length, amount of user processing time, other input and/or output operations and system configuration. The minimum time available for stacker selection for each MICR reader is --

1412 --- 7.5 milliseconds
1419 --- 9.5 milliseconds

At least 9.5 milliseconds are available for stacker decisions on the 1419 for 100 per cent of the documents read. For those cases where the 9.5 milliseconds (7.5 milliseconds for the 1412) of stacker selection time are exceeded and worst case conditions such as minimum document spacing occur, an increase in rejects can be expected. Assume a System/360 Model 30 with a 2 microsecond storage cycle. (The timings in parenthesis pertain to System/360 Model 40). One reader/sorter - The I/O program will use 2.0 (1.2) milliseconds (minimum) to process the external interrupt and 2.8 (1.4) milliseconds (maximum) if a unit check, has occurred on the reader/sorter. Two reader/sorters - the I/O program will use 2.1 (1.20) milliseconds to process the interrupt from each MICR reader whenever the interrupts are not concurrent. Whenever both MICR readers interrupt concurrently, the I/O program will use 4.1 (2.10) milliseconds to process both interrupts. If each MICR reader has a unit check at the time of concurrent interruption, the I/O program will use 5.6 (2.8) milliseconds of the available document gap time. The available time for selection processing will be reduced by the character transfer time associated with concurrent I/O operations and the time needed to complete instruction execution prior to interruption. The I/O control program may take up to an additional .5 (.25) milliseconds to process the external interruption, if any other interruption is being serviced. In making timing calculations, only

one printer can affect, and thereby reduce, the MICR reader document selection time.

Note - Channel contention problems may be minimized by -- Placing the 1412 or 1419's at the highest priority on the multiplexor channel... Disengaging the 1412 or 1419's whenever other I/O operations might conflict.

To determine the processing time available, it is necessary to subtract the time required for the following factors from the average document cycle time. This applies for either one or two MICR readers.

(1) MICR reader(s) interrupt servicing time.
(2) Users document selection time(s).
(3) The time required to get document record(s).
(4) The time required for each I/O operations including the MICR reader(s).

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(5) Character transfer interference times for all I/O operations including the MICR reader(s).

Approximately 5 (2.5) milliseconds will be taken for each I/O operation exclusive of the reader/sorter. This time includes - Start I/O, interrupt servicing and recognition of errors. Approximately 2 (1.0) milliseconds will be taken to get each document record from the input buffer.

MINIMUM SYSTEM REQUIREMENTS - The I/O 1412/1419 program has the following core size requirements -

	Model 30	Model 40
A 1412 or 1419 with 2400 series tape.	4400 bytes	4650 bytes
A 1412 or 1419 with 2311 Disk.	4400 bytes	4650 bytes
Two 1419's with 2400 Series tape.	5600 bytes	5600 bytes
Two 1419's with 2311 Disk	5600 bytes	5600 bytes

Note - When the multiplex capability is used, an additional 160 bytes is required for the control program. One 1412 or one 1419 MICR reader with Adapter Feature (Adapter feature No. 7720 is required if user program includes 1419 or 1412 input)... 2030 Processing Unit (beyond Engineering Change Level 125919) (A Model D is required for dual 1419 operation) (or 2040 Processing Unit Model D) 1419 only... 1412 is not supported on 2040 or 2050 Processing Unit Model F 1419 only... 1412 is not supported on 2050... A card reader (1442, 2501, 2520, or 2540 N1)... a printer (1403, 1404, 1443, 1445, or 1052 Printer Keyboard)... External Interrupt (2030 only) or Direct Control... Standard Instruction Set... appropriate control units.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-IO-059
INPUT/OUTPUT 1418/1428 PROGRAM

DESCRIPTION - Ths Basic Control Program provides a single request queue for input/output operations on the multiplexor channel. The multiplex capability provides four request queues which will permit four unbuffered devices (which do not operate in the burst mode) to operate in the data interleaved mode. If any burst mode (tape or disk) operations are attempted on a multiplexor channel queue, input/output operations which can be multiplexed on the remaining queues will be processed first until all such requests have been serviced. The multiple program facility provided to handle four applications consists of several subroutines that become an integral part of the 1418/1428 Control Program. The multiple program facility uses program ccntrol words (PCW(s)) to transfer control among the user programs. A PCW is a 240 byte area reserved by the user for each of his programs. The control program stores the status of the System/360 when control is being transferred from one user program to another. This facility permits the user to operate one 1418/1428 Reader on-line with a System/360 with up to three other non 1418/1428 programs. Each of the applications is controlled by a separate user program. A user program written for a single 1418/1428 Reader program may be easily adapted for use in a multiple program application. In order to adapt a users single 1418/1428 program to a multiple application -

- A program control work must be provided to control transfer from one user program to another user program.
- Entry points must be provided to the subroutines associated with the multiple program facility.

The input/output 1418/1428 program controls the input and output functions that are associated with such typical OCR processing as formatting, blocking and conversion to magnetic tape or disk storage, batch balancing and punching of out-of-balance data. The control program provides maximum programming flexibility in the time dependent OCR

applications. The following functions are provided for the users problem program -

- Channel scheduler and complete error routines for I/O devices other than the 1418/1428
- Maintenance of a document input buffer.
- Operator communication routine.
- Tape label processing or disk label processing.

The I/O program allows the user to insert his routine for such functions as -

- Stacker determination.
- Formatting of printer, punch, and magnetic tape or disk output.

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- Document arithmetic processing.
- Recognition of control levels.

The program consists of -- Supervisor... Job Control... tape and disk processing routines... Initial Program Loader (IPL). These components (except IPL) the user-provided problem program(s) are assembled, and the resulting object decks (with IPL) are loaded into main storage from cards. The combined deck (Input/Output 1418/1428 Program and the users problem program(s)) allows the processing of data read and effects the reading and writing of other input/output devices which the user may require. Input/output operations and other supervisory functions are requested through the use of the Supervisor-Call (SVC) Interruption feature of the System/360.

The 1418/1428 control program is designed to make possible maximum OCR throughput. Throughput speeds will vary with document length amount of user processing time, and other I/O operations. Disengaging the 1418 or 1428 in order to perform a burst mode operation on the multiplexor channel or any other operation requiring a disengage will decrease throughput. The maximum stacker select time for the 1418 and 1428 is 10 ms plus any additional time provided by terminating the last read command prior to the trailing edge of the document passing the "DOCUMENT END 4" sensing station. If the read command is terminated with the trailing edge of the documents passing the selected document end switch setting, the following times are available -

Document end	1	94 ms
	2	63 ms
	3	25 ms
	4	10 ms

Assume a System/360 Model 30 with a 1.5 microsecond storage. The times for a 2 microsecond storage cycle are shown in parentheses. The control program will use a maximum of 1.5 (2.0) milliseconds to process each external interrupt and .75 (1.0) millisecond (maximum) additional if a unit check has occured. Concurrent I/O operations will deduct from the users stacker selection routine. The time needed to complete the instruction being executed when the interrupt occurs will also reduce the available time.

The I/O program can delay the external interrupt up to .38 (.5) milliseconds if another interrupt is currently being processed. Document rejects will occur when the available stacker select time is exceeded.

Note - Channel contention problems may be minimized by: (1) Placing the 1418 or 1428 as the highest priority on the multiplexor channel... (2) Disengaging the 1418 or 1428 where other I/O operations would conflict. The user will have the following times available for his overlapped process time in the main line program assuming no concurrent I/O operations. These times consider interference from 39 OCR characters per 6 inch document with a single read command in the CCW chain -

1418	113 Milliseconds
1428	113 Milliseconds

Approximately 3.8 (5.0) milliseconds will be required for each I/O operation requested (this includes start I/O, interrupt servicings, and recognition or errors). Approximately 1.5 (2.0) milliseconds will be required to get a document record from the input buffer. Concurrent I/O operations will deduct from the users available process time.

MINIMUM SYSTEM REQUIREMENTS - One 1418 or one 1428 Optical Reader with adapter feature (No. 7720)... 2030 (Model C). (Note that a Model D is required if the multiple program facility is used) or 2040 (Model D) or 2050 (Model F)... 2540, 2520, 2501, or 1442 N1 Card Read/Punch... External Interrupt feature (2030 only) or Direct Control special feature... Standard Instruction Set... appropriate control units... one printer (1403 - 2, 3, N1., 1443 N1, or 1052 Printer-Keyboard)... one card reader (1442 N1, 2540, 2520 B1, 2501 B1 or 2501 B2).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONA. PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-IO-060
BPS/360 INPUT OUTPUT 1231-N1 PROGRAM

DESCRIPTION - The basic control program provides a single request queue for input/output operations ont he multiplexor channel. The multiplex capability provides fcur request queues which will permit four unbuffered devices (which do not operate in the burst mode) to operate in the data interleaved mode. The multiplex capability permits the user to operate up to four 1231 N1 readers on-line with a System/360. If any burst mode (tape or disk) operations are attempted on a multiplexor channel queue, input/output operations which can be multiplexed on the remaining queues

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will be processed first until all such requests have been serviced. The multiple program facility provided to handle up to four applications consists of several subroutines that become an integral part of the 1231 N1 control program. The multiple program facility uses program control words (PCW) to transfer control among the user programs. A PCW is a 240 byte area reserved by the user for each of his programs. The control program stores the status of the System/360 when control is being transferred from one user program to another. Up to four 1231 N1 readers may be distributed in any manner among the four programs. A program written for a single program application may be easily adapted for use in a multiple program application. In order to adapt a single application to a multiple application -

1- A Program Control Work must be provided to control transfer from one user reader program to another user reader program.
2- Entry points must be provided to the subroutines associated with the multiple program facility.

The input/output 1231 N1 program is designed to eliminate the need to program ligical details associated with input and output of 1231 N1 data sheet processing. In addition, the ability to conveniently read, write and control other I/O devices (tape, disk and punched card data processing) is included.

FEATURES -

- Provision for controlling functions of the Master Mark special feature. The Master Mark special feature permits reading data that is recorded common to a specific batch of documents.
- Automatic servicing of interrupts.
- Complete disk and/or tape label checking.
- Control of such 1231 N1 functions as - feeding documents... reading documents... stacker selecting documents... handling validity check conditions.

The Input/Output 1231 N1 Program consists of -- Supervisor... Job Control... tape and disk label processing routines... Initial Program Loader (IPL). These components and the user provided problem program(s) are assembled, and the resulting object decks (with IPL) are loaded into main storage from cards. The combined deck (Input/Output 1231 N1 Program and the users problem program(s)) allows the processor of data read from the optical mark pages and effects the reading and writing of other input/output devices which the user may require in his 1231 N1 applications. Input/output operations and other supervisory functions are requested through the use of the Supervisor-Call (SVC) Interruption feature of the System/360. In a 1231 N1 configuration, throughput will vary with user processing time requirements and other input/output operations. However, the input/output 1231 N1 program is designed to make possible the maximum 1231 N1 reader throughput which is a reated speed of 2,000 data sheets per hour (the IOCP is designed to make possible this throughput rate for each 1231 N1 reader up to maximum of four).

MINIMUM SYSTEM REQUIREMENTS - 2030 (Model C) (A Model D is required if the multiple program facility is used) or 2040 (Model D) or 2050 (MODEL F) or 2065 (Model G)... Standard Instruction Set... one 1231 Optical Mark Page Reader Model N1... one card reader (1442 N1, 2540, 2520 B1, 2501 B1 or 2501 B2)... one printer (1403 - 2, 3, N1., 1443 N1., or 1052 Printer-Keyboard)... appropriate control units.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-PT-045
BPS AUTOTEST (8K-TAPE)

DESCRIPTION - Autotest (8K Tape) is a debugging aid for object programs assembled with the BPS Basic Tape System (8K), may be ordered for use on either 9- or 7-track tape. Using Autotest, runs can be planned to proceed with a minimum of operator intervention. Autotest resides on tape during testing. It controls testing and -

- Provides for the creation of tape data files prior to the test of each program.
- Loads the object program and clears unused core.
- Allows the exchange, addition, or deletion of instructions without re-assembly.
- Monitors the execution of the object program.
- Provides the dump of all or any portion of core storage, permanent storage assignments, and/or general registers whenever a designated address is reached during object program execution.
- Allows Autotest output to be stored on an available scratch tape for later off-line printing.
- Will dump core storage at normal or abnormal end

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of job.
- Prints fixed or variable length, blocked or unblocked tape records.
- Provides an 80-80 listing of input/output cards at end of test session.

MINIMUM SYSTEM REQUIREMENTS - A 16K System/360 with - a 2520 2540, or 1442 Card Read/Punch, or a 2501 Card Reader... a 7-track or 9-track 2400 series Magnetic Tape Unit for system residence (7-track requires the Data Conversion feature)... Standard Instruction Set... a 1403, 1404, or 1443 Printer or one 2400 series Magnetic Tape Unit. Supported optionally -- storage - 32K or 64K... 1052 Printer-Keyboard.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-RG-200
SYSTEM/360 BPS REPORT PROGRAM GENERATOR

DESCRIPTION - The BPS/360 Report Program Generator (Card) is a program language and a processor program that is used to produce machine language object programs. The object programs will be used primarily to produce business reports, but the reports may range from a simple card-to-printer listing to a complete report that incorporates numerous calculations and editing. Some of the capabilities of the language are -

- The object program can obtain data records from as many as three card-input files.
- The object program can match records in as many as three card files to govern processing of the report.
- Input records may be checked for sequence.
- The object program can search tables, and it can use data found in the tables to produce the report.
- Calculations may be performed on data taken from input records or RPG literals.
- The program can branch to a subroutine that has been written in a language other than RPG, perform calculations, and return to the RPG program.
- The report can be produced on as many as three printer or punch files.

MINIMUM SYSTEM REQUIREMENTS - To generate an RPG object program -- 8K bytes of main storage (up to 32K bytes of main storage may be utilized)... card reader... card punch (if object program card deck is desired)... printer (if diagnostics are desired)... Standard Instruction Set... Decimal Arithmetic feature. To execute an RPG object program, the following are required -8K bytes of main storage (up to 32K bytes of main storage may be utilized)... Standard Instruction Set... Decimal Arithmetic feature... I/O units as requird by the object program.

The following card I/O devices and printers are supported 1442 Card Read/Punch... 2501 Card Reader... 2520 Card Read/Punch, Model B1... 2520 Card Punch, Model B2... 2520 Card Punch Model B3... 2540 Card Read/Punch, Model 1... 1403 Printer... 1404 Printer*... 1443 Printer... 1052 Printer-Keyboard**.

*The 1404 Printer may be utilized for continuous forms operations only.
**The 1052 may be used only as an output logging device.

Up to three card input devices and up to three card output devices or printers may be used in any combination. The object program requires at least one card input device and one card output or printer device.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-RG-201
S/360 BPS REPORT PROGRAM GENERATOR PROGRAM (8K TAPE)

DESCRIPTION - This is a problem-oriented language designed to provide users with an efficient, easy-to-use technique for generating programs that can - obtain data records from single-or multiple-input files... perform calculations on data taken from input records or RPG literals... write printed reports... use Table Lookup... exit to a users subroutine written in a language other than RPG... branch within the calculations... sequence-check input records.

MINIMUM SYSTEM REQUIREMENTS - Source program generations -- 8K bytes core storage with... one 2540, 1442 or 2520 B1 Card Read/Punch or 2520 B2 and/or B3 Card Punch (the

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2520 may not be used for a combined file)... one 1443 Printer, 1403 Printer, or 1404 Printer (continuous forms operating only)... three 2400 series Magnetic Tape Units, one of which must be 9-track (if 7-track tape units are used, the Data Conversion feature is required)... Standard Instruction Set... Decimal Arithmetic feature. This program must be integrated into the (360P-AS-091) Basic Programming Support Assembler/IOCS system tape.

Object program execution -- Although the RPG Compiler will operate in 8K, most user object programs will require 16K... I/O units as requested by the specifications... Standard Instruction Set... Decimal Arithmetic feature. Additional machine features supported - Program generation -16K, 32K, or 65K core storage bytes... 2501 Card Reader. Object program execution -- 16K, 32K, or 65K core storage bytes... 2400 series Magnetic Tape Units (7- or 9-track)... up to ten I/O devices (3 of which may be printers) may be used - one input file is required... 2501 Card Reader.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-SM-043
BPS SORT MERGE (8K-TAPE) 1 CHANNEL

DESCRIPTION - The 8K Tape Sort/Merge program is a generalized sort/merge program designed to operate on the System/360. With this program the user can sort records into one sequential file, or merge multiple presorted files into one continuous sequential file. Control-data information can be contained in as many as twelve fields in each record. The sort/merge program is in the form of an assembled object program when it is received by the user. In addition, the facility to create a program tape (9-track, or 7-track if the Data Conversion feature is present) is provided. Control card statements tailor the generalized sort/merge program to the users specific application. If the program will be loaded from cards, the control statements are inserted into the program deck. If the program will be loaded from magnetic tape, the control statements are placed in the card reader. The program assumes that input records for a sort operation are in random sequence; however, if any inherent sequencing exists within the input file, the program will take advantage of it. Records can be sorted or merged into ascending or descending sequence, and an individual sequence can be specified by the user for each control data field. The output sequence for a merge-only operation must be the same as the input sequence.

FEATURES -

- Translates mnemonic control-card information that describes the file parameters for each input and output file.
- Sorts single or multiple input files under control of the volume entry in the INPFIL statement.
- Merges a minimum of one to a maximum of five input files.
- Allows multivolume input and/or output.
- Provides for specification of an alternate input drive (sort only) and an alternate output drive (sort or merge).
- Provides for input from the output to 7-track and/or 9-track magnetic tapes.
- Provides checkpoint, interrupt, and restart procedures during the merge phase (Phase 2) of a sort operation.
- Provides exits to user-written routines.
- Prints out the control card information (optional), record counts at the end of Phase 1 and Phase 2 (optional), and necessary diagnostics.
- Provides the option to bypass unreadable data blocks or to indicate the need for operator intervention.
- Sequence-checks the records during the final pass.
- Sorts or merges on each control field independently, permitting the user to specify either ascending or descending sequence for each individual field.
- Processes standard System/360 volume and file labels.
- Provides standard System/360 IOCS error procedures.
- Allows an alternate work drive to be specified. This allows the maximum input file size to be approximately doubled.
- Supports the 800/1600 bpi Dual Density feature.

MINIMUM SYSTEM REQUIREMENTS - For 1 channel program (360P-SM-043) -- 8,192 bytes of main storage... one multiplexor or one selector channel... three 2400 series Magnetic Tape Units (7- and/or 9-track) (if the optional alternate work drive is used four units are required)... a printer (1403, 1404, or 1443, or a 1052 Printer Keyboard)... a card reader (1442, 2501, 2520 or 2540)... Standard

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Instruction Set.

- One 2816 Switching Unit with two 2403 Magnetic Tape and control Units or two 2803 Tape Control channels. (This combination produces a read-write-compute environment).
- Two 2403 Magnetic Tape and Control Units attached one to each of two selector channels. (This combination produces a read-compute and write-compute environment only).
- Two 2415 Magnetic Tape and Control Units attached on to each of two selector channels. (This combination produces a read-compute and write-compute environment only). The pooled entry (all reading done on one channel and all writing done on the other) of the option statement cannot be specified with this configuration.

The program takes advantage of... a maximum of 65,534 bytes of main storage... up to eleven 2400 series Magnetic Tape Units (7-track and/or 9-track), as follows - up to two for input drives... up to six for work drives... up to two for output drives... one for program residence. 7-track and 9-track tape considerations - The possible combinations of 7-track or 9-track tapes for a sort operation are --

	Character Data Only	Any Data
Input	7T or 9	7D or 9
Work	7T and/or 9	9 only
Output	7T or 9	7D or 9

NOTE - 7T equals 7-track in 6 bit translate mode. 7D equals 7-track in Data Conversion Mode. 9 equals 9-track.

When 7T is used, the data must be fixed-length and 6-bit format because block and record length fields of variable length records are in binary and cannot be read backwards.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, Please refer to those sections following the last "360P" program abstract.

360P-SM-044
BPS SORT MERGE (8K-TAPE) 2 CHANNEL

DESCRIPTION - The 8K Tape Sort/Merge program is a generalized Sort/Merge program designed to operate on the System/360. With this program the user can sort records into one sequential file, or merge multiple presorted files into one continuous sequential file. Control-data information can be contained in as many as twelve fields in each record. The Sort/Merge program is in the form of an assembled object program when it is received by the user. In addition, the facility to create a program tape (9-track, or 7-track if the Data Conversion feature is present) is provided. Control card statements tailor the generalized Sort/Merge program to the users specific application. If the program will be loaded from cards, the control statements are inserted into the program deck. If the program will be loaded from magnetic tape, the control statements are placed in the card reader. The program assumes that input records for a sort operation are in random sequence; however, if any inherent sequencing exists within the input file, the program will take advantage of it.

Records can be sorted or merged into ascending or descending sequence, and an individual sequence can be specified by the user for each control data field. The output sequence for a merge-only operation must be the same as the input sequence. The 2-channel Sort/Merge program is designed primarily for use on a 2-channel system configuration operating in either a Read-Write-Compute or a Read-Compute and Write-Compute environment. It may, however, be used on systems having only one channel (Read-Compute and Write-Compute environment only). The performance obtained by using the 2-channel program on a 1-channel system will generally surpass that of the 1-channel program on the same system provided the system has more than 8K bytes of main storage. This is due to the fact that the 2-channel program uses dual output areas, while the 1-channel program uses only one.

FEATURES -

- Translates mnemonic control-card information that describes the file parameters for each input and output file.
- Sorts single or multiple input files under control of the volume entry in the INPFIL statement.
- Merges a minimum of one to a maximum of five input files.
- Allows multivolume input and/or output.
- Provides for specification of an alternate input drive (sort only) and an alternate output drive (sort or merge).
- Provides for input from and output to 7-track and/or 9-track magnetic tapes.
- Provides checkpoint, interrupt, and restart procedures during the Merge Phase (Phase 2) of a sort operation.

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- Provides exits to user-written routines.
- Prints out the control card information (optional), Record counts at the end of Phase 1 and Phase 2 (optional), and necessary diagnostics.
- Provides the option to bypass unreadable data blocks or to indicate the need for operator intervention.
- Sequence-checks the records during the final pass.
- Sorts or merges on each control field independently, permitting the user to specify either ascending or descending sequence for each individual field.
- Processes standard System/360 volume and file labels.
- Provides standard System/360 IOCS error procedures.
- Allows an alternate work drive to be specified. This allows the maximum input file size to be approximately doubled.
- Supports the 800/1600 bpi Dual Density feature.

MINIMUM SYSTEM REQUIREMENTS - 8,192 bytes of main storate... either one of two selector channels... three 2400 series Magnetic Tape Units (7- and/or 9-track) (if the optional alternate work drive is used four units are required)... a printer (1403, 1404, 1443 or a 1052 Printer Keyboard)... a card reader (1442, 2501, 2520 or 2540)... Standard Instruction Set.

Tape control unit considerations for 2-channel program - If the system has one selector channel and the 2-channel program will be executed, one of the following minimums must be observed -

- One 2415 Magnetic Tape Unit and control. (This combination produces a Read-Compute and Write-Compute environment only).
- One 2403 Magnetic Tape Unit and control or 2803 Tape Control. (This combination produces a Read-Compute and Write-Compute environment only).

If the system has two selector channels and the 2-channel program will be executed, one of four minimum combinations must be observed -

- One 2404 Magnetic Tape Unit and control, or one 2804 Tape Control. (This combination produces a Read-Write-Compute environment).
- One 2816 Switching Unit with two 2403 Magnetic Tape and Control Units or two 2803 Tape Control Units attached one to each of two selector channels. (This combination produces a Read-Write-Compute environment).
- Two 2403 Magnetic Tape and Control Units or two 2803 Tape Control Units attached one to each of two selector channels. (This combination produces a Read-Compute and Write-Compute environment).
- Two 2415 Magnetic Tape and Control Units attached one to each of two selector channels. (This combination produces a Read-Compute and Write-Compute environment only). The pooled entry (all reading done on one channel and all writing done on the other) of the option statement cannot be specified with this configuration.

Additional machine features supported - The program takes advantage of... a maximum of 65,534 bytes of main storage... up to eleven 2400 series Magnetic Tape Units (7-track and/or 9-track), as follows- Up to two for output drives... one for program residence.

7-track and 9-track tape considerations - The possible combinations of 7-track or 9-track tapes for a sort operation are --

	Character Date Only	Any Data
Input	7T or 9	7D or 9
Work	7T and/or 9	9 only
Output	7T or 9	7D or 9

Note - 7T equals 7-track in 6-bit translate mode.
7D equals 7-track in Data Conversion mode.
9 equals 9-track.

When 7T is used, the data must be fixed-length and 6-bit format because block and record length fields of variable length records are in binary and cannot be read backwards.

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-017
SYSTEM/360 ABSOLUTE PROGRAM LOADER

DESCRIPTION - The System/360 Absolute Program Loader (360P-UT-017) loads assembled programs into the storage locations assigned by the assembler. Facilities for making corrections or replacements to the assembled program at load time are also provided. The functions of the Absolute Loader are also provided by the Relocating Loader. This program uses SERUP interface rather than read error recovery routines.

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MINIMUM SYSTEM REQUIREMENTS - Standard S/360 instruction set... 8K main storage... 2540 or 1442 Card Read/Punch or one 2400 series Tape Unit or 2501 Card Reader and the 2520 Model B1 Card Read/Punch... Optional I/O devices - 1403 or 1443 Printer or 1052 Printer Keyboard.

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer tc those sections following the last "360P" program abstract.

360P-UT-018
SYSTEM/360 CARD/TAPE I/O SUBROUTINES

DESCRIPTION - The Card/Tape I/O subroutines is a modular set of Basic Assembler Language subroutines which provide the user with standard, tested I/O support. The desired functions are selected by the user and either combined with his source program as input to the Basic Assembler, or are pre-assembled into relocatable text and combined with the relocatable text of independent assemblies for loading by the relocating loader.

MINIMUM SYSTEM REQUIREMENTS - Standard S/360 instruction set... 8K main storage... one 2501 Card Reader and 2520 Models B1 (Card Read/Punch), B2 and B3 (card punches) or one 2540 or 1442 Card Read/Punch or 1403 or 1443 Printer or 1052 Printer Keyboard or one 2400 series Tape Unit. Optional I/O devices - Any number of each unit. Because the I/O subroutines are loaded into storage with and at the same time as the users program, the input devices for loading are not included.

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-019
SYSTEM/360 DUMP PROGRAM

DESCRIPTION - The System/360 Dump Program (360P-UT-019) provides the facility to print the contents of all or a portion of main storage and the General and Floating Point registers at selected points during object program execution. The output will be suppressed if the associated priority number does not match that requested by the user with a control card at object time, thus providing the facility to activate storage dumping at load time. A two-phase version of this program is provided to econcmize on storage requirements during the execution cf the user's program. This program uses SERUP interface rather than read/punch error routines.

MINIMUM SYSTEM REQUIREMENTS - Standard instruction set... 8K main storage (single phase) - 1403 or 1443 Printer or 1052 Printer Keyboard... Allowances for operator messages are made with these optional I/O devices - 1403 or 1443 Printer or 1052 Printer Keyboard. (two phase) - 2540 or 1442 Card Read/Punch with 1403 or 1443 Printer or 1052 Printer Keyboard - 2501 Card Reader and 2520 Models B1, B2 or B3... or ... one 2400 series Tape Unit with a 1403 or 1443 Printer or 1052 Printer Keyboard. Optional I/O devices - 1403 or 1443 Printer or 1052 Printer Keyboard (used for error messages).

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATICN, please refer to thcse sections following the last "360P" program abstract.

360P-UT-020
SYSTEM/360 RELOCATING PROGRAM LOADER

DESCRIPTION - The distinguishing feature of the Relocating Loader is its ability to relocate separate assemblies and to complete the linkages between them. The functions of the absolute loader are also provided by the Relocating Loader. In addition, the Relocating Loader lists the storage locations of the separate assemblies which it loads. This program uses SEREP interface rather than read error recovery routines.

MINIMUM SYSTEM REQUIREMENTS - Standard S/360 instruction set... 8K main storage... 2540 or 1442 Card Read/Punch or 2400 series Tape Unit or 2501 Card Reader and the 2520 Model B1 Card Read/Punch. Optional I/O devices - 1403 or 1443 Printer or 1052 Printer Keyboard.

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer tc those sections following the last "360P" program abstract.

360P-UT-048
UNIVERSAL CHARACTER SET UTILITY PROGRAM

DESCRIPTION - The BPS Universal Character Set Utility Program is provided to load the special 1403/2821 Read/Write storage. Storage is loaded with the proper arrangement of 240 selected Extended Binary Code Decimal Interchange Codes to cause the proper selection of graphics to be printed.

After loading read/write storage, the program - prints a unique message to identify all arrangements other than special custom-designed or 1400 series arrangements... prints the train or chain image, and... prints any customer identification message provided by an option card. This program will handle the loading of any number of UCS printers.

MINIMUM SYSTEM REQUIREMENTS _ An 8K System/360 with a 2520, 2540, 1442, or 2501 Card Reader... a 1403 Printer Model 2, 3, or N1... and Universal Character Set special feature.

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-050
CARD TO PRINTER AND/OR PUNCH

DESCRIPTION - Transfers binary or EBCDIC data from cards to a printer and/or punch. The card-to-printer function produces printed output in two formats -

- Display - Transfers the contents of a card file to a printer with each record being placed on one print line. The field-select option cannot be performed with Display. In this format the first 20 positions of the print line are reserved for information describing the file.
- List - Input records are transferred to the printer with each record being fully printed. The field select option may be used. In this format the entire print line is available to the user.

Sequence checking can be performed on card input.

The card-to-punch function accepts input records punched in either EBCDIC or binary. Output records may also be in either EBCDIC or binary. The records may be copied or field-selected. Input cards cannot be sequenced-checked.

The card-to-printer and punch function allows EBCDIC input and output records. Printed records are in the List format. Input cards cannot be sequenced-checked.

FEATURES -

- Job description messages may be printed or suppressed using UPSI job-control card option.
- The 1052 is assigned through SYSLOG.
- Punch-check error recovery for 2540 Card Read/Punch for the card-to-printer and/or punch and tape-to-card programs.
- Stacker control for the card-to-printer and/or punch program.
- Field selection instructions are generated into upper storage to ensure fastest possible manipulation of data.
- I/O area assignments are computed based on available storage space and size of input and output blocks to allow maximum advantage to be taken of device and process overlap for a given block size.
- Control cards need not be prepared if the assumed parameters of the program meet job requirements. (For example, the tape-to-printer program is preset to Data Display mode for up to a 1000 byte block with single spacing. These assumed parameters can be altered by the user to suit any permanent scheme he employs in his installation.)
- 7-track and/or 9-track tape drives may be used.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2400 series Tape Unit (with or without the 7-track feature).

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-051
CARD TO TAPE

DESCRIPTION - This program transfers the contents of a card file from card to tape. The cards may be punched in either EBCDIC or binary. The input records must be fixed-length unblocked, and each logical record must fit on one card. The maximum size record is 80 bytes for EBCDIC and 160 bytes for binary.

These files may be copied, reblocked, field-selected, or reblocked and field-selected. An option is available for specifying the number of logical records to be bypassed before processing starts.

FEATURES -

- Job description messages may be printed or suppressed using UPSI job-control card option.
- The 1052 is assigned through SYSLOG.
- User file label routine communication and linkage is performed through general registers.
- Ability to log a file label when label discrepancies occur.
- Writing of initial tape mark on an unlabeled output file may be prevented using UPSI job-control card option.
- Field selection instructions are generated into upper storage to ensure fastest possible manipulation of data.
- I/O area assignments are computed based on available storage space and size of input and output blocks to allow maximum advantage to be taken of device and process overlap for a given block size.
- Control cards need not be prepared if the assumed parameters of the program meet job requirements.
- 7-track and/or 9-track tape drives may be used.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2400 series Tape Unit (with or without the 7-track feature).

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-052
TAPE TO PRINTER

DESCRIPTION - This program can display a tape file in two formats - Data Display and Data List. Data Display provides a byte-for-byte representation of the data file. This format can handle fixed, variable, and undefined records. Data List provides a simple edited representation of the file. Input records for this format must be fixed or variable length, and the field-select option may be used. An option is available for specifying the number of logical records to be bypassed before printing starts.

FEATURES -

- Job description messages may be printed or suppressed using UPSI job-control card option.
- The 1052 is assigned through SYSLOG. User file label routine communication and linkage is now performed through general registers.
- Ability to log a file label when label discrepancies occur.
- First character forms control.
- Field selection capabilities for variable length records.
- Support for multi-file reels on labeled and unlabeled input tapes.
- Field selection instructions are generated into upper storage to ensure fastest possible manipulation of data.
- I/O area assignments are computed based on available storage space and size of input and output blocks to allow maximum advantage to be taken of device and process overlap for a given block size.
- Control cards need not be prepared if the assumed parameters of the program meet job requirements. (For example, the program is preset to Data Display mode for up to a 1000 byte block with single spacing. These assumed parameters can be altered by the user to suit any permanent scheme he employs in his installation).
- 7-track and/or 9-track tape drives may be used.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

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- For program loading and control cards - 1442 Card Read/ Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card/Punch... 2400 series Tape Unit (with or without the 7-track feature).

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-053
TAPE TO CARD

DESCRIPTION - This program transfers the contents of a tape file to a card file. The output file may be in either EBCDIC or binary. Each logical output record must fit into one card (80 bytes for EBCDIC or 160 bytes for binary). Unless only a portion of the input record is transferred through the field-select or reblock-and-field-select option, the input record size will be restricted to 80 or 160. Input records to the program must be fixed length. These files may be copied, reblocked, field-selected, or reblocked and field-selected. Blocked input records must be reblocked. An option is available for specifying the number of logical records to be bypassed before punching starts.

FEATURES -

- Job description messages may be printed or suppressed using UPSI job-control card option.
- The 1052 is assigned through SYSLOG.
- User file label routine communication and linkage is performed through general registers.
- Ability to log a file label when label discrepancies occur.
- Punch-check error recovery for 2540 Card Read/Punch.
- First character stacker select.
- Support for multi-file reels on labeled and unlabeled input tapes.
- Field selection instructions are generated into upper storage to ensure fastest possible manipulation of data.
- I/O area assignments are computed based on available storage space and size of input and output blocks to allow maximum advantage to be taken of device and process overlap for a given block size.
- Control cards need not be prepared if the assumed parameters of the program meet job requirements.
- 7-track and/or 9-track tape drives may be used.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/ Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms cnly)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2400 series Tape Unit (with or without the 7-track feature).

NOTES: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-054
TAPE TO TAPE

DESCRIPTION - This program transfers a file from one or more tape reels to one or more other reels. The files may be copied, reblocked, field-selected, or reblocked and field-selected. If the reblock or field-select options are used, the input records must be fixed or variable length. An option is available for specifying the number of logical records to be bypassed before the copy function is initiated.

FEATURES -

- Job description messages for all programs may be printed or suppressed using UPSI job-control card option.
- The 1052 is assigned through SYSLOG.
- User file label routine communication and linkage is performed through general registers.
- Ability to log a file label when label discrepancies occur.
- Writing of initial tape mark on an unlabeled output file

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may be prevented using UPSI job-control card option.
- Field selection capabilities for variable length records.
- Blocking and deblocking of variable length records.
- Support for multi-file reels on labeled and unlabeled input tapes.
- Field selection instructions are generated into upper storage to ensure fastest possible manipulation of data.
- I/O area assignments are computed based on available storage space and size of input and output blocks to allow maximum advantage to be taken of device and process overlap for a given block size.
- Control cards need not be prepared if the assumed parameters of the program meet job requirements.
- 7-track and/or 9-track tape drives may be used.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/ Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer Keyboard.
- Supported devices also include - 2520 Card Punch... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-055
BASIC PROGRAMMING SUPPORT MULTIPLE UTILITY PROGRAMS

DESCRIPTION - BPS allows one to three utility operations to be performed simultaneously. The operations which can be performed are - Card-to-Tape, Tape-to-Printer, and Tape-to-Card. Any combination of utility operations may be initially selected (e. g., two tape-to-printer and one card-to-tape operations).

1. Card-to-Tape
 Transfers binary or EBCDIC data from cards to magnetic tape.
2. Tape-to-Printer
 Transfers data from magnetic tape to printer. The data may be listed (one logical record per line). The operation will also recognize the first character of a record as a forms control character on formatted tapes.
3. Tape-to-Card
 Transfers data from magnetic tape to cards. Data can be punched in EBCDIC or binary.

The Multiple Utility program assigns I/O areas based on the size of input and output blocks. This feature allows maximum program efficiency through device and processing overlap. The assignment is dynamic in the multiple utility environment, thus giving maximum efficiency at all times. The Multiple Utility program will process 7 and/or 9-track tapes.

MINIMUM SYSTEM REQUIREMENTS - 8K main storage... 1442 or 2540 or 2501 Card Read/Punch or 2520 Model B1 Card Read/Punch or 2520 Models B2 and B3 Card Punch for prog. loading and control cards.. One or more 1443, 1403, 1404 (continuous forms only) Printers... SYSLOG device typewriter or printer, 1052 Printer Keyboard is required for the Multiple Utility Program... operates on systems with multiplexor only, or with multiplexor channel and selector channel. 2400 series Magnetic Tape Units, Models 4, 5 and 6 may also be used as input and/or output devices.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-056
BPS STORAGE PRINT PROGRAM

DESCRIPTION - A program that produces a printout of storage and registers to aid the user in locating the reason(s) for a program malfunction.

MINIMUM SYSTEM REQUIREMENTS - 8K of main storage... 2520-B1 or 2540 Card Reader/Punch for program loading and control cards... One or more 1443, 1403, 1404 (continuous forms only) Printers... 2501 Card Reader may also be used.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P"

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program abstract.

360P-UT-057
BPS INITIALIZE TAPE PROGRAM

DESCRIPTION - In order to perform IBM standard label checking on tapes, IBM standard volume labels must be present. This program places volume labels on tape. The initialize tape program prepares up to eight volume labels, one dummy header label (HDR1 followed by binary zeros), and a tape mark on any number of tapes supplied. No label checking is performed. The user has two options for creating the volume labels on tape.

1. A single control card can be used to provide (for example) the starting volume serial number, the owner name and address code, and the Protection Code. This information will be written on the first tape supplied. Each succeeding tape will have the same volume label written on it with the exception that the serial number will be incremented by one.
2. From one to eight volume label image cards can be used as a set to write unique volume label(s) on each tape initialized. This card is the exact image of the 80 character label. This option should be used when the volume serial number field contains any alphameric values.

Following the volume label(s), a dummy header label is written, followed by a tape mark. This completes initialization. The tapes may then be either rewound or rewound and unloaded as the user specified.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-061
COPY DISK TO TAPE AND RESTORE TAPE TO DISK

DESCRIPTION - This program consists of two separate decks, one to copy a disk onto one or more tapes, and the other to restore a disk from the previous tapes. The program will copy and restore a disk in one of two ways -

- Copy and Restore Volume - With this option one entire disk pack is copied and restored, including RO, IPL records, data records, volume label(s), and the VTOC.
- Copy and Restore File - With this option, one data file may be copied and restored. The file may consist of more than one volume. RO's are copied for the area occupied by file, and IPL records may be optionally copied.

The program assigns I/O areas based on the size of core storage. I/O overlap is performed if core storage is equal to or greater than 16K and channel assignment permits. The restored records occupy areas of the 2311 identical to the original file.

PERFORMANCE - The performance figures below are based on the following machine configurations -

- 8K System/360 Model 30.
- 2540 Card Read/Punch.
- For 360P-UT-061, a printer (as described in MINIMUM SYSTEM REQUIREMENTS), one 2311 Disk Drive and one 2400 series 9-track Magnetic Tape Drive (900KC), both attached to the selector channel.

The figures are also based upon processing a 1316 Disk Pack on which each track contains 9 data records of 300 bytes each.

- Copy Disk to Tape requires approximately 4 minutes if no errors occur.
- Restore Tape to Disk requires approximately 5.5 minutes if no errors occur.

Usage Considerations -

- No record ID (count field) may be repeated on a track.
- RO must be written according to IBM standards.

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(K sub 1 equals 0, D sub 1 equals 8).
- No ID (count field) other than RO may contain a record number indication of zero.
- A file copied to tape on a machine size of 16K or greater cannot be restored to disk on a machine smaller than 16K.
- 1316 Disk Packs must have been initialized with standard home addresses, RO's and a volume label, according to IBM standards. The disk pack may have been used between initialization and restoring a file from tape.

MINIMUM SYSTEM REQUIREMENTS -

- 8,192 bytes of main storage...
- A card reader (1442, 2501, 2520 Model B1, or 2540) for program loading and control cards...
- At least one 2311 and one 2400 series Tape Drive (if 7-track tape the Data Conversion feature must be present)...
- An IBM 1403, 1445, 1404 (continuous forms only) Printer or an IBM 1052 Console Printer for program logging and diagnostic messages.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-062
BPS COPY DISK TO CARD AND RESTORE CARD TO DISK

DESCRIPTION - BPS/360 Copy Disk-to-Card and Restore Card-to-Disk consists of two decks, one to copy a disk onto cards; and the other to restore a disk from those cards.

The program copies and restores a disk in one of two ways -

- Copy and Restore Volume - With this option one entire disk pack will be copied and restored, including RO, IPL records, data records, volume label(s), and the VTOC.
- Copy and Restore File - With this option, one data file may be copied and restored. The file may consist of more than one volume. RO's are copied for the area occupied by the file, and IPL records may be optionally copied.

The program will assign I/O areas based on the size of core storage. I/O overlap will be performed if the core storage is equal to or greater than 16K and channel assignment permits. The restored records will occupy areas of the 2311 identical to the original file. An option is available in both the copy deck and the restore deck to restart at the beginning of any track that has been processed, or, in the case of the consecutive open at the beginning of the pack, if the program has been terminated prior to completion.

The performance figures contained in this section are based on the following machine configuration -- System/360, Model 30 with 8K of main storage... a 2540 Card Read/Punch... a printer (as described in MINIMUM SYSTEM REQUIREMENTS)... One 2311 disk drive and one 2540 punch. The performance is further based upon processing a 1316 Disk Pack on which each track contains nine data records of 300 bytes each... Copy Disk to Card runs at approximately 300 CPM if no errors occur... Restore Card to Disk runs at approximately 1000 CPM if no errors occur.

MINIMUM SYSTEM REQUIREMENTS - 8,192 bytes of main storage... A card reader for program loading and control card reading (1442, 2501, 2520 Model B1, or 2540)... appropriate Input/Output devices - at least one 2311 and one punch (2540, 2520, and 1442)... a 1403, 1443, 1445, or 1404 (continuous forms only) Printer or a 1052 Printer Keyboard for program logging and diagnostic messages.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-063
BPS CARD TO DISK

DESCRIPTION - The Card-to-Disk program transfers the contents of a card file from cards to an area of disk. The cards may be punched in Extended Binary Coded Decimal or in binary. The input records must be fixed-length unblocked, and each logical record must fit on one card. The maximum-size input record is 80 bytes, or 160 for binary. These files may be simply copied, block by block; or reorganized by altering the number of records in the block (reblocking); or reorganized by deleting or repositioning the fields within the record (field selecting) as well as reblocking.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

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- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-064
BPS DISK TO CARD

DESCRIPTION - The Disk-to-Card Program transfers the contents of a disk file to a card file. The output file may be punched in either Extended Binary Coded Decimal or Binary. Each logical-output record must fit on one card (i. e., 80 bytes for Extended BCD or 160 bytes for binary). Unless only a portion of the input record is transferred through the field-select option, the input-record size will be restricted to 80 or 160. Input records to this program must be fixed length. Files in this program may be copied, reblocked, field selected, or reblocked and field selected.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer. (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-065
BPS DISK TO TAPE

DESCRIPTION - The Disk-to-Tape program transfers a file from one or more disk units to one or more tape units. These files may be copied, reblocked, field selected, or reblocked and field selected. If the field-select or reblock options are to be used, the input records must be fixed-length. The data portion of the output tape is preceded by a tape mark.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-066
BPS TAPE TO DISK

DESCRIPTION - The Tape-to-Disk program transfers a file from one or more tape reels to a maximum of five disk units. These files may be copied, field selected, reblocked, or reblocked and field selected. If the field-select or reblock options are to be used, the input records must be fixed length.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core

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storage.

- For program loading and control cards - 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation - Input/Output devices required by the specific program.
- For logging and error messages - 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include - 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-067
BPS DISK TO DISK

DESCRIPTION - The Disk-to-Disk Program transfers a file between disk units, or between areas of the same unit. A maximum of six drives can be assigned by assigning one as input, one as output, and the remaining as both input and output. Using the same device for input and output can cause a reduction in performance. Files can be copied, reblocked, field selected, or reblocked and field selected. If the field-select or reblock options are to be used, the input records must be fixed length.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards- 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read.Punch... or 2540 Card Read Punch.
- For program operation- Input/output devices required by the specific program.
- For logging and error messages- 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include- 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-068
BPS CLEAR DISK

DESCRIPTION - The Clear Disk Program clears one or more areas of IBM 2311 disk storage, and establishes a pre-formatted track containing an indicated base throughout the area cleared. for each track cleared, records are formatted to the end of the track. The maximum number of records depends on the size of the records. The area to be cleared can be as small as one track or up to a maximum of a complete disk pack. As many as five areas can be designated to be cleared with one run of this program. When an area of disk is cleared, fixed-length blocks containing count, key, and data areas are established on the disk. The information defining the key and data areas is indicated in the utility-modifier card, or, if a utility-modifier card is not entered, assumed values are made. The key and data areas defined are filled with a user-defined character. Label-checking is done to determine if the area to be cleared contains all or part of an unexpired file. Expired labels for the area to be cleared are deleted from the VTOC.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards- 1442 Card Read.Punch... or 2501 Card Reader... or 2520 Card Read Punch... or 2540 Card Read Punch.
- For program operation- Input.output devices required by the specific program.
- For logging and error messages- 1403 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer.. or 1052 Printer-Keyboard.
- Supported devices also include- 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-069
BPS INITIALIZE DISK

DESCRIPTION - The initialize Disk Program prepares from one to five complete disk packs for use on IBM 2311 Disk Drives. The preparation of a pack consists of the following-

- VTOC label check
- Home-address generation
- Surface analysis and track descriptor (RO) record generation
- Volume-label creation
- IPL and VTOC format creation

VTOC label check- before a pack is initialized, it is checked see if any labels present in the VTOC are expired. If the file has not expired, a message is printed. If the user still wishes to initialize the disk pack after receiving the message, he can bypass the label and continue to process. If the user does not wish tc bypass the pack(s) with unexpired labels, the pack or packs are deleted from the job.

Home-address generation- Five bytes of the seven-byte home address are written by this program in binary r presentation. If the home-address cannot be written on a track, a message is printed to identify each home-address that cannot be written. If a home-address cannot be written for every track of a pack, that pack is deleted from the job.

Surface analysis and track descriptor (RC) record generation surface analysis is performed first on the alternate cylinders (200, 201, and 202). When a track on an alternate cylinder is found to be defective, the track is flagged as defective and cannot be assigned as an alternate track. Surface analysis is then performed on all remaining tracks. If a track is detected to have a defective surface area upon which data cannot be written, an alternate track is established to record the data. A message is printed to notify the user of defective tracks. Processing is terminated after detection of the thirty-first defective track (30 alternate tracks). The defective tracks are logged to provide a record of the condition of each pack processed. When analysis has shown that a track is not defective, the track descriptor record (RO) is written. If the track-descriptor record cannot be written on a track, a message is printed to identify the error. The program continues analysis and RO generation to log any other defective tracks. The pack on which the error occurs is deleted from the job.
Volume-label creation- Through the use of a control card unique tc this program, a volume label is created in the standard format (VOL1) for each pack processed. The volume label is written on cylinder zero, track zero, record three of one and two. Record one is written with a 24-byte data field of binary zeros. Record two is written with a 144-byte data field of binary zeros.

VTOC format creation- The initialize disk program pre-formats the Volume Table of Contents (VTOC). The location on the disk in which the VTOC is to be placed is indicated in a control card. The standard location of the VTOC is on cylinder zero immediately following the volume label(s), and extending to the end of the cylinder. However, the VTOC can appear on any cylinder (excluding alternate cylinder), but cannot exceed cylinder boundaries. A VTOC placed anywhere other than in the standard location can be any number of tracks desired on the cylinder.

MINIMUM SYSTEM REQUIREMENTS - 8,192 positions of core storage.

- For program loading and control cards- 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read/Punch.
- For program operation- Input/output devices required by the specific program.
- For logging and error messages- 1403 Printer... or 1404 Printer... or 1404 Printer (continuous forms only) or 1443 Printer... or 1052 Printer-Keyboard.
- Supported devices also include- 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-071
BPS COPY DATA CELL TO TAPE AND RESTORE DATA CELL TC TAPE

DESCRIPTION - BPS/360 DASD Utility Program, Copy Data Cell tc Tape and Restore Tape to Data Cell consists of two decks, one to copy a data cell onto one or more tapes; and the other to restore a data cell from the tape(s). The program copies and restores a data cell in one of two ways-

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- Copy and Restore Volume - With this option one entire data cell will be copied and restored, including RO, IPL records, data records, volume label(s), and the VTOC.
- Copy and Restore File - With this option one data file may be copied and restored. the file may consist of more than one volume. RO's are copied for the area occupied by the file, and IPL records may be optionally copied.

The program will assign I/O areas based on the size of main storage. I/O overlap will be performed if the main storage is equal to or greater than 16K and channel assignment permits. The restored records will occupy areas of the 2321 identical to the original file. An option is available to checkpoint and restart during program execution. An additional tape drive is required to support this option.

The performance figures contained in this section are based on the following machine configuration -- System/360, Model 30 with 16K of main storage... one 2400 series Mod 3 Tape Drive... a printer (as described in minimum system requirements)... one 2321 Data Cell Drive. The performance is further based upon processing a complete 3021 Data Cell on which each track contains five data records of 300 bytes each... Copy Data Cell to Tape takes approximately 40 minutes if no errors occur... Restore Tape to Data Cell takes approximately 80 minutes if no errors occur.

MINIMUM SYSTEM REQUIREMENTS- 16,384 bytes of main storage... a card reader for program loading and control card reading, (1442, 2501, 2520, and 2540)... appropriate input.output devices -- one 2321 and one 2400 series Tape Drive (if 7-track tape the Data Conversion feature must be present)... a 1403, 1443, 1445, or 1404 (continuous form only) Printer; or 1052 Printer Keyboard for program logging and diagnostic messages.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer tc those sections following the last "360P" program abstract.

360P-UT-072
COPY DISK TO DISK

DESCRIPTION - This program consists of one deck that copies one disk to another. It performs the identical functions of 360-UT-061, with the exception that there is nc intermediate storage medium used. Two disk drives are required; files may not be copied from one area tc another on the same pack.

The performance figures below are based on the following machine configurations-
8K System/360 Model 30. 2540 Card Read/Punch. For 360P-UT-072, two 2311 Disk Drives, both attached to the selector channel. The figures are also based upon processing a 1316 Disk Pack on which each track contains 9 data records of 300 bytes each. Approximately 4 minutes are required to copy disk to disk if no errors occur.

Usage Considerations-

- No record ID (count field) may be repeated on a track.
- RO must be written according to IBM standards. (K sub 1 equals 0, D sub 1 equals 8).
- No ID (count field) other than RO may contain a record number indicatcn of zero.
- A file copied to tape on a machine size of 16K or greater cannot be restored to disk on a machine smaller than 16K.
- 1316 Disk Packs must have been initialized with standard home addresses, RO's and a volume label, according to IBM standards. The disk pack may have been used between initialization and restoring a file from tape.

MINIMUM SYSTEM REQUIREMENTS-

- 8,192 bytes of main storage... A card reader (1442, 2501, 2520 Model B1, or 2540) for Program loading and control cards...
- Two 2311's, one for input and one for output...
- An IBM 1403, 1443, 1445 or 1404 (continuous forms only) Printer or an IBM 1052 Console Printer for program loggin and diagnostic messages.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-073
BPS DISK TO PRINTER

DESCRIPTION - The Disk-to-Printer program can display a disk file in two different formats- Data-Display and Data-List. Data-Display provides a visual picture of the data where every byte appears in the printed output. This

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format can handle fixed, variable, and undefined records. Data-list provides a simple edited list of the file. Input records must be fixed length, and the field select option can be used. The input file can come from a maximum of five disk units.

MINIMUM SYSTEM REQUIREMENTS - 1,192 positions of core storage.
- For program loading and control cards- 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read Punch... or 2540 Card Read/Punch.
- For program operation-input/output devices required by the specific program.
- For logging and error messages- 1401 Printer... or 1404 Printer (continuous forms only)... or 1443 Printer.. or 1052 Printer-Keyboard.
- Supported devices also include- 2520 Card/Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-098
ALTERNATE TRACK ASSIGNMENT

DESCRIPTION - This program is designed to assign an alternate track to a defective track on an IBM 2311 Disk Pack at any time other than when initializing the pack.

When a defective track is encountered, the Volume Table of Contents is checked to determine the next alternate track to be assigned. If an alternate track is available, the records contained on the defective track are transferred to it. Surface analysis is performed on the track in error after all records have been transferred to the alternate track. If the (home address and/or the Track Description Record (RO) area(s) is defective, all records associated with the track in error are printed, and the program is terminated. If these areas are not defective, but a permanent error exists elsewhere on the track, the data records remain on the alternate track, and the job is completed. If the error is only temporary, the data records are transferred back to the originally defective track.

An indication is given to show where errors occur and the action that is to be taken. An option is available allowing all records, or only the invalid records transferred to an alternate track, to be printed on the printer, or on the printer-keyboard. If an error is found in the home address or RO area, this option is ignored and all records are printed.

MINIMUM SYSTEM REQUIREMENTS- 8,192 positions of core storage... a card reader (1442, 2501, 2520, or 2540) for program loading and control cards... a SYSLOG device (1403, 1404, or 1443 Printer or 1052 Printer-Keyboard) for logging and error messages... a 2311 Disk Storage Unit.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-202
BPS UTILITY PROGRAM - TAPE COMPARE

DESCRIPTION - Tape Compare compares two files from two or more tape reels to ensure that the files are identical. The number of reels in each file need not be equal. Reels containing fixed, variable, or undefined record lengths may be compared. Physical records which do not compare are printed with an index of the bytes that do not match and the corresponding physical record number. A user routine may be supplied for processing records that are not identical. When possible, two input areas are assigned to each tape to allow overlap of processing with physical I/O if channel assignments permit. The compare operation may be terminated at any time by pressing the 1052 Request Key or Console Stop Key. A compare operation for a new file can be initiated by supplying the correct control card and following the restart procedures.

MINIMUM SYSTEM REQUIREMENTS- 8K of main storage... a card reader for program loading and control cards... appropriate input/output devices... SYSLOG device (may be 1052 Printer Keyboard or a printer). The selector channel is not required for the tape compare program.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-203
BPS UTILITY PROGRAM - MULTIPLE DISK TO PRINTER

DESCRIPTION - Multiple Disk to Printer allows from one to three disk-to-printer functions to be performed simultaneously. Each function is capable of printing (in character mode) fixed length records with or without key fields. The records may be either blocked or unblocked if key fields are absent. If they are present, the records must be unblocked. One printer and one disk unit must be on-line for each separate function being performed. A new function may be started at any time while other functions are in process. When the job of any function is complete, a new job may be initiated for that function. The multiple disk to printer program makes efficient use of core storage when assigning I/O areas. To allow for a maximum available I/O area, active I/O areas are assigned contiguously. When possible, two disk input areas are assigned for each function to allow overlap of input with processing and output.

MINIMUM SYSTEM REQUIREMENTS - 16K of main storage.

- For program loading and control cards- 1442 Card Read/Punch... or 2501 Card Reader... or 2520 Card Read/Punch... or 2540 Card Read Punch.
- For program operation- The disk unit(s) must be attached to a selector channel... the printer(s) must be attached to a multiplexor channel.
- For logging and error messages- 1052 Printer-Keyboard.
- Supported devices also include- 2520 Card Punch... 2311 Disk Storage Drive... 2400 series Tape Unit (with or without the 7-track feature)

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-204
BPS INITIALIZE DATA CELL

DESCRIPTION - System/360 BPS Initialize Data Cell, prepares from one to five data cells for use on any 2321 Data Cell Drive. The program initializes the data cells with a method compatible to Operating System/360. The preparation of each of these cells consists of-

- VTOC label checking.
- Home-address and track-descriptor record(RO) generation.
- Surface analysis and initialization verification.
- IPL, volume-label, and VOTC format creation.

Two types of control information are required by the program job control-card information, and utility-control information. The job control-card information relates to the channel and unit assignment and physical device description. The utility-control information, which is provided in the utility modifier statement and the label control-card set, specifies which data cell(s) is to be initialized, and provides the labeling information for VTOC and volume label creation.

VTOC label checking- Before a cell is initialized, a check is performed to see if a VTOC is present. If the cell has been previously initialized and the VTOC is present, any labels in the VTOC are checked to see if the files on the data cell have expired. If any files have not expired, a message is printed. If the user still wishes to initialize the cell after receiving the message, he can bypass the label condition and continue to process. If the user does not wish to bypass the condition, that cell may be deleted from the job.

Home address generation- A binary, five-byte home address is written on every track by the program. The five bytes written are- FLAG, SUBCELL number, STRIP (finger) number, cylinder (head bar) number, and track (element) number. The flag byte, which is propagated to the flag byte of each record on the track, is used to indicate the condition (defective or not defective) of the track, and whether or not it has been assigned as an alternate track.

Track descriptor (RO) generation- A track descriptor record or record zero (RO) is written as the first record following the home address. It is divided into two parts- count and data. If an error occurs in the home address or RO area, the home address and record zero are advanced 800 bytes and are rewritten. The track is then flagged defective, and an alternate track is assigned. If an error occurs at this time, the program is terminated.

Surface Analysis and Initialization Verification- Surface analysis is performed first in an alternate track area consisting of 400 tracks. Tracks in this area found to be defective are flagged and cannot be assigned as alternate tracks. Surface analysis is then performed on all remaining tracks of the cell. If defective ones are encountered, alternate ones are established in the alternate track area. If there are no more alternate tracks available, the cell

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is deleted from further processing. Messages are printed on SYSLOG to notify the user of defective tracks, assigned alternate tracks, and their locations. An initialization verification routine ensures that the home address and track descriptor record have been written on each track, and that surface analysis has been performed on every track.

IPL-format creation- The program formats two IPL records. These are written on cylinder zero, track zero, records one and two. Record one is written with a 24-byte data field of binary zeros. Record two is written with a 144-byte data field of binary zeros.

Volume-label creation- Using a control card unique to the program, a volume label is created in the standard format (VOL1) for each cell processed. Seven additional user volume labels (VOL2-VOL8) can be created, if desired.

VTOC-format creation- The program pre-formats the Volume Table of Contents (VTOC), reserving the first two record locations in it for the volume table of contents - data set control block (VTOC - DSCB) label, and the space-management label. The location on the cell in which the VTOC is to be placed is indicated in a control card. The standard location is on cylinder zero immediately following the volume label(s), and extending to the end of the cylinder. The VTOC can, however, appear on any cylinder (excluding alternate cylinders), but cannot exceed cylinder boundaries.

MINIMUM SYSTEM REQUIREMENTS- 16K bytes of core storage... a card reader (1442, 2501, 2520, or 2540) for program loading and control cards... SYSLOG device (1403, 1404 or 1443 Printer, or 1052 Printer-Keyboard) for logging and error messages... one 2321 Data Cell.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-206
BPS/360 16K INITIALIZE DISK

DESCRIPTION - The program will perform all of the functions of the Initialize Disk Program (360P-UT-069) with these improvements -

- Perform surface analysis of only those tracks not previously flagged as defective. The tracks already flagged as defective are left unchanged.
- Optionally, perform surface analysis of all tracks, including those tracks previously flagged as defective.
- Flag individually specified tracks as defective without performing surface analysis.
- Optionally, perform the surface analysis of each track up to a total of 255 times.
- Perform initialization of from one to five 2316 Disk Packs mounted on the IBM 2314.

The selection of functions to be performed is indicated on a utility modifier statement inserted in the program deck by the user.

MINIMUM SYSTEM REQUIREMENTS - 16K, card reader, printer, disk drive (2311 or 2314).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-207
BPS/360 16K ALTERNATE TRACK ASSIGNMENT (2311, 2314)

DESCRIPTION - The program will perform all of the functions of the alternate track assignment program (360P-UT-098) with these improvements -

- The specified track will be flagged defective and an alternate track assigned without performing surface analysis of the specified track.
- Optionally, surface analysis will be performed on the specified track (or its assigned alternate) and an alternate track will be assigned only if the surface analysis fails.
- Optionally, remove the defective indication from the specified track and unassign the alternate track.
- Optionally, perform surface analysis of the specified track up to a total of 255 times.
- Perform the selected functions on either an IBM 2311 or an IBM 2314.

Selection of the added options is indicated through additional parameters in the utility modifier statement.

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MINIMUM SYSTEM REQUIREMENTS - 16K, card reader, printer, disk drive (2311 or 2314).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-208
UTILITY FOR PROGRAM DISTRIBUTION

DESCRIPTION - The BPS/360 distribution program is designed to perform the following functions -

- Build two tape loadable programs on an output tape. The two programs are an Initialize Disk (2311/2314) program and a Restore Tape to Disk program.
- Copy one or more disk files, defined by the file name parameter on the utility modifier cards, to the output tape(s).
- The volume built by the above two steps will allow a disk pack to be initialized by the first tape loadable program and allow that disk pack to be restored with the disk file(s) information contained on the tape volume by the second tape loadable program.

MINIMUM SYSTEM REQUIREMENTS - System/360 with 16K bytes of main storage... card reader (1442, 2501, 2520, or 2540)... printer (1403, 1404 (continuous forms), 1443 or 1445... printer keyboard (1052)... tape drive (2400 series)... disk drive (2311 or 2314).

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-212
ALTERNATE TRACK ASSIGNMENT (2321)

DESCRIPTION - The BPS/360 Alternate Track Assignment (2321) is designed to assign an alternate track to a defective track on a 2321 data cell at any time other than when initializing the cell. When a defective track is encountered, the Volume Table of Contents is checked to determine the next alternate track to be assigned. If an alternate track is not available, the condition is logged and the job is terminated. If an alternate track is available, the records contained on the defective track are transferred to it. An indication is given to show where errors occur and the action taken. An option is available allowing either all records, or only the invalid records which are transferred to an alternate track, to be printed on the assigned logging device. If an error is found in the home address or track descriptor record areas, this option is ignored and all records are printed as they are transferred. Surface analysis is performed on the track in error after all records have been transferred to the alternate track. If the home address or track descriptor record areas are not defective, but a permanent error exists elsewhere on the track, the defective track points to the alternate track, and the job is completed. If the error is only temporary, the data records are transferred from the alternate track back to the originally defective track. If the home address or track descriptor record areas are defective, the home address and track descriptor record are advanced 800 bytes and are rewritten to allow the track to be flagged defective. If an error occurs while attempting to advance these areas, the program is terminated. If no error occurs, the defective track points to the alternate track and the job is completed.

MINIMUM SYSTEM REQUIREMENTS - 16,384 bytes of main storage... a card reader (1442, 2501, 2520 B1, or 2540) for program loading and control cards... a SYSLOG device (1403, 1404, or 1443 Printer, or 1052 Printer-Keyboard) for logging and error messages... a 2321 Data Cell Drive and 2841 Control Unit.

Notes: This program is part of the IBM System/360 Basic Programming Support (BPS/360) package. For BASIC PROGRAM PACKAGE, OPTIONAL PROGRAM PACKAGE and ORDERING INFORMATION, please refer to those sections following the last "360P" program abstract.

360P-UT-213
DIRECT ACCESS STORAGE DEVICE INITIALIZATION PROGRAM

DESCRIPTION - The System/360 Direct Access Storage Device Initialization Program, is provided for users of System/360 Model 40 and 50 1410/7010 Emulator programs who require initialization of 2302 Disk Storage Units and the 2321 Data Cell Drive. It is identical to the DASDI program

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contained in the OS independent utilities (360S-UT-507). DASDI has been packaged as a separate program for distribution to non-users of the System/360 Operating System.

The System/360 DASDI Utility Program performs two separate functions; it initializes 2302 Disk Storage Units, and assigns alternate tracks on the 2302. A single DASDI job can initialize one 2302 module and assign alternates for specified tracks on one module. The 2321 Data Cell Drive is supported in the same manner.

This program is intended for the OS/360 user. Non-OS/360 users should not mistakenly order this as a BPS utility program.

MINIMUM SYSTEM REQUIREMENTS - This program may be used to initialize 2302 Disk Storage Units and 2321 Data Cell Drives on any System/360 meeting the minimum system requirements of either the System/360 Model 40 or 50 1410/7010 Emulator programs, 360C-EU-726 and 360C-EU-728.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... O/S Utilities Programs Manual, C28-6586.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360PUT213

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360P-UT-214
OS/360 DUMP RESTORE

DESCRIPTION - Dump/Restore dumps the data contents of a direct-access volume onto a 2311 disk storage volume or a magnetic tape and restores the data contents to a direct-access volume that resides on the same type device as the source volume. The 2321 Data Cell Drive is supported in the same manner.

This program is intended for the OS/360 user. Non-OS/360 users should not mistakenly order this as BPS utilities.

MINIMUM SYSTEM REQUIREMENTS - A 32K System/360. A 2301 or a 2321 on the system requires 64K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... OS/360 Utility Programs Manual, C28-6586.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360PUT214

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360P-UT-215
OS/360 RECOVER/REPLACE

DESCRIPTION - Recover/Replace attempts to read data from a bad track and, after the operator has corrected the data, replaces it on an alternate track of the direct-access device.

This program is intended for the OS/360 user. Non-OS/360 users should not mistakenly order this as BPS utilities. This utility also supports the 2321 Data Cell Drive.
MINIMUM SYSTEM REQUIREMENTS - A 32K System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Program Material List... OS/360 Utility Programs Manual, C28-6586.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360PUT215

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT

CONTINUED FROM PRIOR COLUMN

	EXTENSION	TYPE	CODE	REQUIREMENT
BASIC	none	CARDS	15	none
		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360P-UT-219 *M
BPS/360 MODULAR FILE MAINTENANCE PROGRAM

DESCRIPTION - The program performs these functions:

- Building of self-loading master and update DTR(s) such as those on which IBM will now supply BPS programs and updates. This function can be employed by users to prepare master and update tapes containing user-written programs.

- Update of current master tapes by merging with an update DTR(s) to produce new master tapes. IBM will supply update DTR(s) only for the basic volumes of BPS programs. For the optional volumes, complete replacements must be ordered.

- Retrieval of individual programs from both master and update DTR(s). The output media can be card, tape, printer, or any combination of these.

- Retrieval of header records only to identify the programs on masters and update DTR(s).

Each master and update DTR supplied by IBM consists of two files. The first file contains IPL, supervisor, job control, and the update/retrieval phase of the Modular File Maintenance Program. The second file is a series of data modules, each containing a header record and one phase of a BPS program (IPL, supervisor and job control are each considered phases of a BPS program). The header records on a current master and an update DTR(s) control the merging operation by which a new master is created. A program phase is omitted from the new master when the header for that phase on the update DTR(s) specifies a delete action.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30, 40 or 50 with 8K bytes of main storage... Card Reader - 1442, 2501, 2520 or 2540... Card Punch - 1442, 2520 or 2540... Printer - 1403, 1404 (continuous forms only) or 1443... Tape - 2400-series, 9-track or 7-track with Data Conversion feature. One to three drives required depending on functions performed.

BASIC PROGRAM PACKAGE
DOCUMENTATION - The following SRL publications and documentation appropriate only to the components ordered are shipped by PID with each initial BPS/360 order. This following Volume numbers correspond to the machine readable VOL numbers.

Volume 1 -	BPS/360 Programmer's Guide-8K Tape	C24-3354
	BPS/360 Assembler with Input/Output Macros	C24-3355
	BOS/BPS/360 Macro Definition Language 8K Disk/Tape	C24-3364
	BPS/360 Operating Guide-Basic Tape System 8K	C24-3391
	BPS/360 System Generation and Maintenance - Basic Tape System	C24-5061
	BPS/360 Specifications - Report Program Generator	C24-3418
Volume 2 -	S/360 Basic FORTRAN IV Language	C28-6629
	BPS/360 FORTRAN IV Programmer's Guide	C28-6583
Volume 3 -	BPS/360 Modular File Maintenance Prog. Specifications and Operating Guide	C24-5069
	BPS/360 Sort/Merge Prog. Specifications	C24-3320
	BPS/360 Sort/Merge Operating Guide	C24-3413
	BPS/360 Autotest Specifications 8K Tape	C24-3343
	BPS/360 Autotest Operating Guide 8K Tape	C24-3417
Volumes 3 and 4 -	BPS/360 Specifications-Card and Tape Utility Programs	C24-5026
	BPS/360 Operating Guide - Card and Tape Utility Programs	C24-5027
	BPS/360 Operating Guide - Universal Character Set Utility Program	C24-3396
Volume 4 -	BPS/360 DASD Utility Programs-Specs.	C24-3363
	BPS/360 DASD Utility Programs-Operating Guide	C24-3392
	BPS/360 Distribution Program Specifications and Operating Guide	C21-5001
Volume 5 -	BPS/360 Basic Assembler and Basic Utility Programs (Card) Specs. and Operating Guide	C28-6503
	BPS/360 Specifications - Report Program Generator - Card	C24-3374
	BPS/360 Operating Guide - Report	

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Program Generator	C24-3464
BPS/360 Support Programmer's Guide for FORTRAN IV	C21-5000
BPS/360 Support Programmer's Guide for FORTRAN IV - 16K Card	C21-9040
Volume 6 - BPS/360 Input/Output 1412/1419 Specs. and Operating Guide	C24-3398
BPS/360 Input/Output 1418/1428 Specs. and Operating Guide	C24-3437
BPS/360 Input/Output 1231	C24-3408

MACHINE READABLE - Machine readable material for all 360P programs is contained on six (6) functional volumes. The machine readable for VOLs 1-5 is in object form. The machine readable for VOL6 is in source form. Following is a list of the components, their Program Numbers, and appropriate Program Number Extensions.

Program Title	Program Number	Program No. Extension
	360P	VOL1
Assembler and Control System	AS091	
RJF Work Station Program	CQ218	
RPG (Tape)	RG201	
	360P	VOL2
FORTRAN (Tape)	FO031	
	360P	VOL3
Sort/Merge 1	SM043	
Sort/Merge 2	SM044	
Autotest	PT045	
UCS	UT048	
Card-to-Printer/Punch	UT050	
Card-to-Tape	UT051	
Tape-to-Printer	UT052	
Tape-to-Card	UT053	
Tape-to-Tape	UT054	
Multiple Utilities	UT055	
Storage Print	UT056	
Initialize Tape	UT057	
Tape Compare	UT202	
Modular File Maintenance	UT219	
	360P	VOL4
Copy/Restore Disk/Tape	UT061	
Copy/Restore Disk/Card	UT062	
Storage Print	UT056	
Initialize Tape	UT057	
UCS	UT048	
Card-to-Disk	UT063	
Disk-to-Card	UT064	
Disk-to-Tape	UT065	
Tape-to-Disk	UT066	
Disk-to-Disk	UT067	
Clear Disk	UT068	
Initialize Disk 2311	UT069	
Copy/Restore D.C./Tape	UT071	
Copy/Restore Disk/Disk	UT072	
Disk-to-Printer	UT073	
Alternate Track Assignment 2311	UT098	
Multiple Disk-to-Printer	UT203	
Initialize Data Cell 2321 (16K)	UT204	
Initialize Disk 2311/2314 (16K)	UT206	
Alternate Track Assign 2311/2314 (16K)	UT207	
Dist Prog for DOS/360 2311/2314 (16K)	UT208	
Alternate Track Assign 2321	UT212	
	360P	VOL5
Absolute Loader	UT017	
IOSP	UT018	
Single Phase Dump	UT019	
Reloc. Loader	UT020	
Card Assembler	AS021	
RPG (Card)	RG200	
FORTRAN (Card)	FO205	
	360P	VOL6
1412-1419 IOCP	IO058	
1418-1428 IOCP	IO059	
1231 IOCP	IO060	

Basic machine readable material for the following 360P programs, in addition to being available on the volumes shown above, can be obtained in card form. If cards are preferred, specify each program desired (as shown below) in columns 4-12 and specify medium code 15 in columns 21-22 of the Program Order Form.

Program Title	Program Number
Card Assembler	360PAS021
FORTRAN (Card)	360PFO205
1412-1419 IOCP	360PIO058
1418-1428 IOCP	360PIO059
1231 IOCP	360PIO060
RPG (Card)	360PRG200
Absolute Loader	360PUT017

CONTINUED FROM PRIOR COLUMN

IOSP	360PUT018
Single Phase Dump	360PUT019
Reloc. Loader	360PUT020
UCS	360PUT048
Card-to-Printer/Punch	360PUT050
Storage Print	360PUT056
Copy/Restore Disk/Card	360PUT062
Card-to-Disk	360PUT063
Disk-to-Card	360PUT064
Disk-to-Disk	360PUT067
Clear Disk	360PUT068
Initialize Disk 2311	360PUT069
Copy/Restore Disk/Disk	360PUT072
Disk-to-Printer	360PUT073
Alternate Track Assignment 2311	360PUT098
Multiple Disk-to-Printer	360PUT203
Initialize Data Cell 2321 (16K)	360PUT204
Initialize Disk 2311/2314 (16K)	360PUT206
Alternate Track Assgn 2311/2314 (16K)	360PUT207
Alternate Track Assgn 2321	360PUT212

OPTIONAL PROGRAM PACKAGE

DOCUMENTATION - Program Material List and appropriate Attachment.

MACHINE READABLE - Optional machine readable material (source code) is contained on five functional volumes which contain the same program numbers per volume as the five basic volumes, numbers 1-5. No optional material is required for basic volume number 6 as basic material is in source form. In addition, there is no optional material available for programs 360P-UT-056, 360P-UT-018, and 360P-FO-205.

ORDERING INFORMATION: SYSTEM NUMBER 360P

Note: Both the basic and optional machine readable material for this system is ordered by specifying a "System Line" (Columns 1-7, of the Program Order Form. Enter a separate Component Line for each component desired. Respecify the System Line for each different Program Number Extension.

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	VOL1	DTR	9/1600	29	none
		MT	9/800	28	01
	VOL2	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
	VOL3	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
	VOL4	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
	VOL5	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
	VOL6	DTR	9/1600	29	none
		DTR	9/800	28	none
		DTR	7DC/800	26	none
OPTIONAL	VOL1	MT	9/1600	29	01
		MT	9/800	28	01
	VOL2	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL3	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL4	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7/DC/800	26	01
	VOL5	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01

360S *N

OPERATING SYSTEM/360

DESCRIPTION - The System/360 Operating System (better known as Operating System/360) is the most comprehensive operating system available for users having 64K or more of core storage. OS/360 offers the broadest range of control program options, language processors, I/O device support, application programs, and service programs to meet the needs of users who will benefit from the more extensive facilities that a large operating system can provide. The control program performs the supervisory functions of job management and scheduling, resource allocation,

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I/O scheduling, location, storage and retrieval of data and monitoring multiprogramming activity. Device independence is achieved through symbolic allocation of I/O devices and execution-time selection of device dependent routines. This feature of OS/360 results in effective I/O resource utilization, independent of program compilation specifications. Dynamic program loading facilities, which permit the automatic retrieval of programs or segments of programs, are especially beneficial to those users considering complex teleprocessing systems, graphic data processing applications, or total information systems. A specially generated system may be tailored to match the machine configuration and, the Operating System options which best meets the users requirements. The Primary Control Program (PCP), which is the base of all OS/360 control programs, provides for the inclusion of all basic OS/360 functions which are appropriate for single job execution and are upward compatible with other control program options. Multiprogramming with a Fixed number of Tasks (MFT) permits the concurrent processing of several jobs, one per partition, in a user controlled, partitioned core storage environment. Multiprogramming with a Variable number of Tasks (MVT) provides for the scheduling of a variable number of jobs to be run concurrently, depending on the core space available, in a dynamically allocated core storage environment. This reduces the requirements for user control and intervention. A wide range of processing programs including assemblers, compilers, and service programs are available with OS/360. The language processors are provided at various core storage requirement levels and include PL/1, COBOL, Assembler, RPG, FORTRAN, and ALGOL. Service programs are Sort/Merge, Linkage Editor, Remote Job Entry, Graphic Job Processor, Testran, and Utilities. The following paragraphs describe the components of the system, Minimum System Requirements, I/O Device Support, Publications and Distribution.

CONTROL PROGRAM - Functions

SUPERVISORS (PCP/MFT/MVT)

PRIMARY CONTROL PROGRAM (PCP) 360S-CI-505

The base on which all control programs are built. When generating a system, functional capabilities may be selected in a variety of combinations and added to those included in PCP to produce additional capabilities. The supervisor in general controls the use of the CPU, I/O, and main storage automatically and as requested by a user through system macro instructions. The primary supervisor provides:

- Resident access methods.
- In core library search (BLDL).
- Job step main storage protection.
- Control of a single task.
- Overlap of CPU operations with I/O channel activity.
- Error checking and standard I/O error recovery procedures.
- Queueing of I/O requests for channel use.
- Two SVC transient areas.
- Supervision and processing of all types of interruptions.
- Dynamic allocation of main storage for load modules.
- Synchronous overlay supervisor.
- Block loading of relocatable programs.
- Systems environment recording - SERO, SERI, EREP. (The recorded information, I/O error log-out information in main storage is transcribed by other diagnostic programs.)

Services available to user programs through system macro instructions include:

- Locating a named program.
- Dynamically loading and transferring control to a named program.
- Specifying exits for selected program interruptions.
- Saving registers at the start of a subroutine.
- Returning to the calling routine or next higher control level.
- Waiting for the completion of an event.
- Waiting for the completing of multiple events.
- Posting the completion of an event.
- Identifying an inbedded subprogram to the supervisor so that it can be shared within the same task.
- Dynamically allocating or releasing variable amounts of main storage.
- Writing a message to the operator with a reply required.
- Setting the timer to interrupt after some time interval.
- Testing or resetting the time interval previously requested.

MULTIPROGRAMMING WITH A FIXED NUMBER OF TASKS (MFT) 360S-CI-505

Provides all the facilities of PCP and in addition, provides simultaneous operation of up to 15 problem program partitions with job to job transition for both user application and system functions available in any partition. The additional functions in MFT are:

- Control of up to 15 single task jobs.
- Control of up to 3 system input readers (resident or transient).

CONTINUED FROM PRIOR COLUMN

- Control of up to 36 system output writers.
- Small problem program partitions (8K or more).
- Dynamic Partition Definition - operator can redefine partitions without reinitializing system.
- Data set integrity - prevents multiple tasks from concurrently using the same data set.
- Storage Protection - problem program integrity (write protect) is maintained by supervisor assigned protection keys.
- System Restart - after re-IPL is performed, jobs not previously initiated for execution are in the ready queue. The output queue contains all job output that has not been completely transcribed to tape, cards or printer. Jobs that were in execution are removed from the system. Whatever data that was placed in the output queue by such jobs can be printed or punched.
- Provision for conditional requests for resources (ENQ/DEQ).
- Priority Job Class Scheduling - provides for more effective balancing of system resources by permitting the assignment of jobs by type to a partition.
- Telecommunications Support - both BTAM and QTAM are supported. QTAM requires two partitions; one partition for message control, the second partition for message processing. In any given system there can only be one BTAM partition.
- Graphics Support - provides Graphic Programming Services including all features for the 2250 Models 1, 2, and 3 and the 2260 Direct Attachment.
- Disk SYSIN allows disk to be used as a source for a Reader/Interpreter's input job stream.

MULTIPROGRAMMING WITH A VARIABLE NUMBER OF TASKS (MVT) 360S-CI-535

Includes the supervisor functions of MFT although there are significant differences in its use of storage. MFT operates in fixed partitions which can only be changed by operator action; while in MVT, a part of the available core storage (i.e. dynamic area) is allocated as a region to a job step as it is initiated. Region requirements usually vary from job step to job step. Thus, the use of storage in MVT may better reflect the requirements of the job mix at a point of time. The supervisor uses the MVT Priority Scheduler and the Interval Time feature. The functions in addition to those provided with OS/360 PCP and MFT are:

- Concurrent control of a variable number of tasks.
- Dynamic creation and synchronization of subtasks.
- Task dispatching on the basis of priorities which may be changed by the task itself during execution.
- Scatter loading of relocatable programs within an assigned main storage region.
- Control Block protection prevents problem programs from destroying system Control Blocks.
- Link Pack Area for reentrant system routines.
- Asynchronous overlay supervision.
- More than two SVC transient areas are available in order to increase the performance of the system when several SVC routines from the Link Pack Area or the SVC LIB are required concurrently.
- Shared Modules - a directory of modules currently residing in main storage together with information describing their use and attributes so that, if their attributes permit, the modules may be shared within a job step. Across Job Step sharing is controlled by a separate directory of modules selected by the user for inclusion in the resident portion of the control program provided for this use.
- Rollout/Rollin - allows one job to obtain additional main storage by displacing the contents of one or more regions occupied by lower priority jobs. The rolled out region(s) are returned to their original locations in main storage when the job step requiring the extra main storage releases them.
- Job Step Timing - timing information reflecting the actual CPU time for a job step. Job steps are terminated when the time limit is exceeded.
- Model 65 Multiprocessing - an extension of the MVT option that combines two CPU's under one supervisor program residing in main storage. The CPU's are treated as system resources and are assigned by the supervisor to process any task. Multiprocessing provides more efficient and more flexible allocation of CPU's, I/O units, and main storage. Availability is increased by Recovery Management Support, which minimizes the impact of intermittent failures and by Storage Reconfiguration which bypasses failing components and deallocates affected resources, allowing the reconfigured system to continue accepting and processing jobs without reinitialization.

OS/360 SYSTEMS MANAGEMENT FACILITIES (SMF)

SMF provides "automatic data collection" by gathering and recording information associated with the use of the computing system. This information can be used to optimize and plan the orderly growth of OS/360 multiprogramming installations. It is provided as a SYSGEN option that can be used with existing OS/360 configurations. Its use is recommended as an installation aid in controlling the activity within OS/360 multiprogramming systems.

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Automatic data collection is provided to record:

- CPU time for processing programs
- Start and stop times for jobs and steps
- Region or partition size used by the program
- Priority of the job when executed
- Counts of SYSOUT, DD*, and DD DATA logical records
- Job, step and program names
- Status of job and/or step at termination
- Identification of devices allocated to each step and, for each device, a count of EXCP's issued for each data set processed using the devices
- Maximum main storage required by each step
- User exits at Key points

Primary Control Program (PCP) and Conversational Remote Job Entry are not supported.

The OS/360 System Management Facilities (SMF) is available as an option of the MVT control program. It gathers, formats, and records basic system and user information. Customers can use this information to determine the resources such as CPU, I/O and main storage used by each program.

Features -

When SMF is selected at System Generation, the functions provided are:

- "Automatic data collection" by gathering and recording information associated with the use of the computing system by each job and optionally, by each step.
- Exits in the Reader/Interpreter to edit the Job Control Language (JCL) card images for jobs entering the system and to augment the SMF collected data.
- Exits in the Initiator/Terminator to validate and augment the SMF collected data.
- Exits when CPU time or WAIT time limits are exceeded.
- SMF provides a system routine, invoked by a macro, to record information on the system management data set in standard record format, with overlapped recording. The routine uses a tape or a DASD (of the same device type used for System Residence).
- SMF options can be specified from a system data set at IPL-time and can be overridden by the operator.

Performance -

If SMF is not chosen at System Generation, there will be no degradation of the system.

The performance degradation is dependent upon the installations use of the following:

- SMF buffer size
- Device used for the SMF data set
- SMF data set allocation size
- Number of jobs run per day
- Execution time of the installation exit routines

The performance degradation to the system when all System Management Facilities are functioning can be less than 5 per cent.

Storage Requirements -

A fixed amount of main storage is required when SMF is chosen at System Generation. In MVT a maximum of 1500 bytes is added to the main resident storage. In MFT, 6150 bytes including BSAM is required. Supervisor Queue Space is used for data collection tables, new job queue entries, and the user defined SMF buffer. The variable storage depends on the number of active jobs in the system and the SMF options chosen.

Other Facts -

Job Control Language used with current jobs will continue to operate correctly. An additional optional parameter will be added to the JOB statement to allow a user to limit job time. BSAM will be used for recording SMF data.

ADDITIONAL OS/360 FUNCTIONS

The advanced checkpoint/restart for PCP, and MVT provides the following capabilities:

- External suppression of checkpointing and restarting through JCL.
- An end-of-volume exit routine to allow Checkpointing when end-of-volume for BSAM or QSAM data sets occurs.
- A SYSGEN facility to allow the user to determine which user or system/ABEND conditions will result in an automatic restart.
- Unit and volume switching at restart time.
- Automatic quiescing of I/O operations.
- COBOL E and F and SORT support.
- Automatic restart from a job step for from a checkpoint. Automatic restart must be specifically authorized by the operator. In addition, in MVT, the operator may defer the execution of an automatic restart. A deferred restart can be made by the programmer through JCL.

CONTINUED FROM PRIOR COLUMN

Main Storage Hierarchy Support for LCS: Main Storage Hierarchy Support for 2361 Models 1 and 2 is optional feature supported under PCP, MFT, and MVT. (Excluding MVT Model 65 Multiprocessing.) Main storage is divided into two hierarchies, LCA, and Processor Storage, and a combination of either is selectable under user control.

SCHEDULERS (SEQUENTIAL, PRIORITY)

The schedulers in general regulate the flow of jobs through the computing system, provide for I/O device assignments, and serve as the interface between user and system through the Job Control Language, operator commands, and console messages.

- Composite Console - a card reader and printer used to stimulate the actions of a printer-keyboard.
- Channel Separation and Affinity Requests.
- Frequently used sets of job control statements may be stored in a procedure library; any time that a procedure is to be executed, the user need only specify the procedure name on the EXECUTE statement.
- Automatic Volume Recognition - allows the operator to mount labeled volumes on unused I/O devices. The scheduler then determines if the desired volume is mounted on any of the "unused" devices. If so, the device is allocated to the step. AVR supports all 9 and 7-track tape drives in the density specified at system generation time and the 2311 Disk Storage Drive and 2314 Direct Access Storage Facility.

MFT PRIORITY SCHEDULER

MFT has a non-resident priority scheduler requiring a minimum partition size of either 30K or 44K. It supports one task per job step with 1 to 15 user jobs and 37 system functions, of which three may be readers and 36 may be writers, being processed concurrently, The schuduler operates as follows:

- Main storage is divided into a maximum of 15 problem partitions.
- Each partition can service up to three job queues (job classes).
- Job classes are assigned priority within parition. A job class can be assigned to more than one partition.
- Each partition has a fixed task dispatching priority within the system for scheduling CPU execution.
- Jobs are enqueued on job class queues by class. The job class is specified in Job statements.
- Position on the job class queue is determined by the priority specified on the Job statement.
- Jobs are dequeued and initiated by priority within class by the Initiator/Terminator.
- Small program partitions are only scheduled when a scheduler size partition (30K or 44K) is available.
- Data sets created on direct access devices by problem programs and system messages created by the Initiator/Terminator are written by the output writers on printers, punchers or magnetic tapes.

COMPREHENSIVE PROGRAMMING SUPPORT FOR THE MODEL 85 (MVT or MFT)

The Model 85, being upward System/360 compatible, executes programs which run on other System/360 models. The Model 85 has new features which require programming systems support extensions beyond that new in OS/360. These extensions, which are in addition to the MVT and MFT capabilities already announced, include support of:

- CRT Operator Console
- Extended Precision Floating Point
- Recovery Management Support

CRT Operator Console (Feature 5450) - All console functions can be directed to the new CRT operator console, or the CRT console and the 2150 console can be used as alternates. In addition to the normal console functions, the new functions include information displays designed to simplify console operation.

Extended Precision Floating Point Support - Extended precision (112 bit fraction) floating arithmetic instructions are standard in the Model 85. These instructions permit extended precision floating point operands to be added, subtracted and multiplied to produce extended precision results. In addition, two long precision operands (65 bit function) can be multiplied to produce an extended precision result.

Recovery Management Support (RMS) - The Model 85 provides a number of standard features to enhance system availability. Included are: Error checking and correction, micro-diagnostics, processor checking, manual switches for storage reconfiguration, and automatic retry of most instructions. In addition, OS/360 provides Recovery Management Support (RMS) for the Model 85.

OS/360 MULTIPLE CONSOLE SUPPORT (MCS) FOR MFT, MVT, and M65 MULTIPROCESSING

The growth potential of OS/360 multiprogramming and

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multiprocessing systems has been increased with the support of multiple consoles on communication lines and the addition of new types of consoles. OS/360 console configurations are no longer limited by cable restrictions making it possible to have a S/360 installation on multiple floors or even in multiple buildings.

MCS will enhance the productivity of OS/360 installations by providing:

- Increased Throughput
 . Realized by the location of additional consoles adjacent to the functional area.
- Better System Control
 . Achieved by a message routing that controls the flow of messages and the method of display.
- Higher Availability
 . By additional alternate consoles and console switching capability.
- Increased Installation Planning Flexibility
 . By the support of multiple consoles on communication lines in addition to cables...by providing control program user exits.

MCS supports the 2740 Communication Terminal Model 1 when attached to a 2701 Data Adapter Unit or a 2702 Transmission Control and the System/360 Model 85 Operators Console in addition to the currently supported console devices. A maximum of 32 operator consoles are supported.

MVT PRIORITY SCHEDULER

MVT employs the same scheduler as MFT with some exceptions:

- Small partition scheduling is available in MVT if the Initiator/Terminator is in LINK-PAC.
- MVT employs priority both in job selection as in MVT but also uses priority for scheduling execution. In MFT execution, priority is determined by parition.
- The MVT scheduler is a minimum of 52K and may be resident or non-resident. Its size is dependent upon the extent of track stacking.

MODEL 65 MP GRAPHICS AND ASSYMETRIC SUPPORT

- Graphic Programming Sercies
- Graphic Programming Services for FORTRAN
- Graphic Job Processor
- FORTRAN Subroutines for Data Transmission between a S/360 M65 MP and an 1130
- Job Control from an 1130 to a 2250 using the Satellite Graphic Job Processor
- Assymetric Support for the 1443, 2150, 2250, 2260, 2701, 2702, 2703, 2840, 2848

MODEL 65 MP K SIZE MEMORY

Allows for up to 4 additional 2365-13 core storage units to be attached to the Model 65 Multiprocessor.

DATA SET CONTROL (CATALOG, VOLUME TABLE OF CONTENTS (VTOC)

DATA SET CONTROL 360S-DM-508

These functions which control all data in the system and regulate the use of data sets, include provision for:

- Data set location control, supported by a cataloging system, enables programmers to access data sets by symbolic name, without specifying volume serial number or location of the volume. Classification of data set names stored within the catalog according to installation needs (general usage, private usage, temporary, permanent, always resident, or portable storage).
- A system of labels and label checking.
- Successive generations of related data sets, controlled by a Generation Data Group feature.
- Control of direct access storage space allocation; allocating specific space or any available space as requested by the programmer. When the original space provided is not adequate, an automatic extension of space can be provided.
- Passwork Protection - optional protection of specified data sets from unauthorized use.
- The following additional data set control capabilities will be provided:
 - Facilities for handling user data set labels.
 - Error statistics by tape volume.

ACCESS METHODS

DATA ACCESS

The data access facilities provided by the operating system permit the user to select that method which most efficiently meets his application data storage and retrieval requirements. The input/output routines efficiently schedule and control the transfer of data between main storage and input/output devices. These routines are loaded into main storage when the data set is opened, and

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they are released from main storage when no longer required. The programmer can select from various data access methods to obtain facilities tailored to his processing requirements. Each access method supplies a comprehensive set of macro-instructions that permit the programmer to specify, input/output requests with a minimum of effort. Access methods provide for:

- Device independence.
- Reading and writing data randomly and sequentially.
- Blocking and deblocking records.
- Overlapping reading/writing and processing operations.
- Detecting error conditions and correcting them when possible.

SEQUENTIAL ACCESS METHODS 360S-DM-508

BASIC SEQUENTIAL ACCESS METHOD - BSAM

Data is sequentially organized; physical blocks of data are stored or retrieved. The read/write macro instruction causes the initiation of an input/output operation. The completion of these operations are tested by using synchronization macro instructions.

QUEUED SEQUENTIAL ACCESS METHOD - QSAM

Data is sequentially organized. Logical records are retrieved or stored as requested. The access method anticipates the need for records based on their sequential order, and normally will have the desired record in main storage, ready for use, before the request for retrieval. When writing data, the program normally will continue as if the record had been written immediately, although the access method's routines may block it with other logical records, and defer the actual writing until the output buffer has been filed.

BASIC PARTITIONED ACCESS METHOD - BPAM

This access method when used in conjunction with BSAM, is designed for efficient storage and retrieval of discrete sequences of data (members) belonging to the same data set on a direct access device. Each member has a simple name. The data set includes a directory that relates the member name with the address where the sequence begins. Members may be added to a partitioned data set as long as space is available.

DIRECT ACCESS METHOD 360S-DM-509

BASIC DIRECT ACCESS METHOD - BDAM

Records within a data set are organized on direct access volumes in any manner chosen by the programmer. Storage or retrieval of a record is by actual or relative address within the data set. This address can be that of the desired record or a starting point within the data set, where a search for the record, based on a key furnished by the programmer begins. Addresses are also used by BDAM as starting points for searching for available space for new records.

INDEXED SEQUENTIAL ACCESS METHODS 360S-IO-526

QUEUED INDEXED SEQUENTIAL ACCESS METHOD - QISAM

Records in direct access storage are stored and retrieved in a logical sequence based on some data key or control field of the record. A multi-level set of indexes relating data keys or records to physical addresses is automatically built and maintained. QISAM is used to create an indexed sequential data set, and to retrieve and update records sequentially from such a data set. Synchronization of the program with the completion of input/output transfer, and record blocking/deblocking are automatic.

BASIC INDEXED SEQUENTIAL ACCESS METHOD - BISAM

This access method stores and retrieves records randomly from an indexed sequential data set. Selective reading is performed by using the READ macro-instruction, and specifying the key of the logical records to be retrieved. Individual records can be replaced or new records added randomly.

The following additional features of ISAM will be provided:

- Variable length Record.
- Read Exclusive.

ISAM-VLR provides the ability to create and maintain variable length data records when using the Index Sequential Access Method. It permits more economical use of storage when user records vary in length.

New data processing applications may now be feasible due to the reduced storage cost made possible by the use of this feature.

Characteristics -

- Variable length data records follow the standard V-type

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record format.
- No physical spannding is allowed.
- All index records and keys are fixed in length.
- All macros valid for fixed length records are valid for variable length records.
- User program changes are necessary to utilize the VLR capability by the use of Assembly Language Programs.
- All data records in a given ISAM data set must be of one format, either fixed or variable.
- The Resume Load facility is not available for VLR data sets.
- The Data Set Utility, IEBISAM will support ISAM - VLR at the time of its release.
- The VLR Feature supports all configurations and devices presently supported by OS/360 ISAM.

ISAM - VLR is based upon the design and code of the Fixed Length ISAM. Where applicable, new modules corresponding to their Fixed Length counterparts will be to provide VLR support. Certain of the present Fixed Length ISAM modules are common and will be used for processing both Fixed and Variable Length Records.

Core Storage Requirements

Core requirements for ISAM - VLR are as follows:

- Variable Length Records increases the core requirements of the access method up to 30 percent more than fixed length records.
- Fixed Length Records requires up to 2 percent more core to accommodate the changes necessary for ISAM - VLR.

Performance -

Compared to fixed length ISAM, internal processing time (including I/O Supervisor time) will be as follows:

- Variable Length Records requires up to 15 percent more time than fixed length records.
- Fixed Length Records requires up to 2 percent more processing time to accommodate the changes necessary for ISAM - VLR.

The actual amount of core and processing time will be less in most cases.

TELECOMMUNICATIONS ACCESS METHODS

QUEUED TELECOMMUNICATIONS ACCESS METHOD - QTAM 360S-CQ-519

QTAM can support a variety of applications such as message switching, high-volume inquiry, transaction processing. The QTAM facilities include a comprehensive set of message control and editing routines that relieve the programmer assigned to the telecommunications application of the detailed and specialized programming otherwise required for such an application. These routines can be assembled into an integral message control program, which is designed to meet the exact requirements of an installation. To simplify and speed the construction of a message control program, a message control language is provided. This language is compiled by any Operating System/360 assembler program and consists of a set of macro-instructions and parameters. The language is specifically designed for easy use in describing the line configurations, buffer lengths, polling procedures, and types of message editing required for a particular application. QTAM requires MFT or MVT options of the OS/360 Control programs. One or more of the following DASD's is supported by QTAM for intermediate storage of message queues -- 2311, 2314.

BASIC TELECOMMUNICATIONS ACCESS METHOD - BTAM 360S-CQ-513

The BTAM facilities are designed chiefly to provide the basic tools required to write a telecommunications program. These include facilities for creating terminal lists and performing the following operations:

- Polling terminals.
- Receiving messages.
- Addressing terminals.
- Writing messages.
- Changing the status of terminal lists.
- Dynamic buffering.
- Code translation.

BTAM requires either MFT or MVT options of the OS/360 control programs.

The support of Binary Synchronous Communications combined with that of the various start/stop devices such as the 1050 gives BTAM a wide range of applicability and flexibility. BTAM supports both low, medium and high speed devices in one access method. Also included within this support are the 2701/2703 error recovery procedures and error counts. BTAM supports Binary Synchronous Communication over non-switched (leased or private direct connection) and switched (dial) networks for S/360 to S/360, S/360 to Model 20, S/360 to 2780 and S/360 to 1130 communication. OS/360 BTAM Binary Synchronous Communications support communicates with other System/360's

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using OS/360 BTAM DOS/360 BTAM, and BOS/BPS/360 Binary Synchronous Communication support.

OS/360 BTAM 2760 IMAGE UNIT SUPPORT

The 2760 Optical Image Unit is a user oriented data entry device which is attached to 2740 Model 1 Communication Terminal. Images are optically projected on the 2760 screen from a strip of 16mm film, color or black and white, that is stored in a protective cartridge and easily inserted or removed from the optical unit.

OS/360 BTAM 2741 COMMUNICATION TERMINAL

The 2741 is primarily a conversational terminal which provides remote access to a System/360 over point-to-point switched or non-switched communication lines.

BTAM support provides conversational communication between the computer and Terminal at the Read/Write level. Communication is initiated by the terminal operator whose keyboard is always unlocked except when responses are being printed.

SEQUENTIAL SCHEDULER

The Primary Control Program uses the Sequential Scheduler. The Sequential Scheduler is not resident, but is brought into main storage between job steps. Three schedulers are provided, requiring 18K bytes, 44K bytes, or 100K bytes. These schedulers support:

- A single input job stream (unblocked records only).
- Sequential processing of job steps.
- Reading and interpreting of control statements using all features of the job control language except those peculiar to MFT or MVT.
- Assignment of input/output devices.
- Alternate console.

COMMUNICATION SERVICEABILITY FACILITIES - BTAM & QTAM

Communications serviceability facilities are included in QTAM, and as an option in BTAM. It is strongly recommended that these facilities be included since they increase system availability by providing statistics and diagnostic aids for effective system repair and preventive maintenance. The communication serviceability facilities are:

- Error Recovery Procedures:

 These are provided on a line basis and are specified by line group. The operation in error is retried up two times. If the error persists the conditions of the error are posted and a system-to-operator message describing the error is printed at the system operator console. Job termination and system operator print out are provided on certain non-recoverable errors for BTAM. Diagnostic read/write commands (2701 only) are performed to isolate nonrecoverable errors.

- Error Counts:

 Error Counts are maintained on a line basis. These counts will be printed at the system operator console whe a user specified error rate is exceeded. An additional facility enables the user's program to have error statistics from cumulative counters printed at the operator console.

- On-Line Terminal Test:

 Terminal test procedures will operate on-line with the user problem program, and will not impact user operation other than the time required to perform their function, except that when a test is performed using the 2760, the film should be reloaded prior to continuing the job. Tests can be requested from a terminal and returned to that terminal or any other terminal on the same line. (Continued Operation is maintained for unaffected terminals in the system).

 Tests are provided for 1030, 1050, 1060, 2260 (Remote) 2760 and 2740. BTAM support includes tests for a Binary Synchronous Communications network consisting of S/360 to S/360, S/360 to Model 20, S/360 to 1130, to S/360 to 2780.

- Operator Control - QTAM only.

 Operator control is provided as an optional feature to enable the operator to examine and modify QTAM control information and to respond to errors and unusual conditions. IBM 1050 or IBM 2740 terminal with Station Control is used. When operator control is used the telecommunications operator messages may be directed to the telecommunications operator control terminal instead of the system operator console.

- Checkpoint/Restart - QTAM only.

 Checkpoint/restart is provided for the QTAM message control program as an optional facility. The terminal

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table, queue control blocks, and the polling lists are checkpointed on disk at user specified intervals. Two checkpoint records are maintained with a pointer to the most current record. Restart is accomplished by reloading the QTAM message control program. The latest checkpoint of the table and control blocks is read and overlays the initial table and control blocks.

GRAPHIC ACCESS METHOD

GRAPHIC PROGRAMMING SERVICES 360S-IO-523

Graphic Programming Services consists of the functions necessary to handle graphic input/output, and a set of macro-instructions and problem oriented routines that can be used as building blocks in the construction of graphic processing programs. These services support the 2250 Display Unit, Models 1, 2, and 3; and the 2260 direct attachment (local).

- Macro instructions to generate all orders for the 2250, Models 1 and 3, including the Model 1 with the Graphic Design feature.
- Data handling aids for arranging orders and data in main storage prior to transferring them to the graphic device buffer.
- Problem oriented routines that dynamically generate orders and data for displaying on the 2250 Models 1 and 3.

 Alphameric characters.
 Rectangular grids (linear or semi-log).
 Grid labels.
 Polar coordinate grids (linear or semi-log).
 Circles and arcs.

- Input to these routines can be either fixed point or floating point and can be scaled by the routines.
- Graphic Data Generation subroutine - to generate data, during program execution, for use with the 2-byte incremental data modes of the 2250 Model 1 with the Graphic Design feature and 2250 Model 3.
- Light Pen Tracking - 2840 Model 2 buffer subroutine to track the pen movement on the CRT and display a pattern showing its current position.
- The Graphic Access Method (GAM), which includes:

- Read/write level macro instructions for transferring data between main storage and the graphic device buffer.
- Buffer management facilities that allocate, control, and protect sections of the 2250 Model 1 or 2840 buffer.
- Routines that facilitate man-machine communication using the 2250 or 2260 local, at both the express and basic attention handling levels (provides synchronous attention handling).
- Routines that diagnose synchronous errors and accomplish the necessary error handling.

- FORTRAN IV Graphic Subroutines and Functions (See FORTRAN Library for graphic programming services available under FORTRAN).
- Graphic Job Processor and Satellite Graphic Job Processor (See Graphic Systems Support).

MULTIPROCESSING CONFIGURATIONS

Model 65 - The OS/360 multiprocessing system includes two Model 65 processors which, through the use of inter-processor communications, alternate path I/O control, and shared main storage, provide increased flexibility in the use of computing resources. To provide improved load balancing over that attained with two separate systems, resources such as main storage, secondary storage and central processing units can be pooled. A MP/65 multiprocessing system can operate as a single system or as two independent systems. Support for Model 65 multiprocessing is with a single control program through MVT. Shared DASD, 2361 LCS, Time Slicing and 2250 Operator Console Support are the only MVT functions excluded from MP/65 Support. Up to two CPU's can share a pool of 2311 and up to four CPU's a pool of 2314 Direct Access Storage Devices. The catalog, program libraries, and user data sets may be accessed by any CPU. Advantages are reduced file maintenance, improved operational flexibility and reduced disk space requirements. The system established access for each catalog generation. Exclusive access for all other data sets is controllable by using the RESERVE macro. This support is not available under MVT Model 65 Multiprocessing.

PROCESSING PROGRAMS

SHARED DASD

Language Translators: Language translators compile symbolic source programs (source modules) into object programs (object modules). Object modules serve as input to the Linkage Editor which produces the relocatable program.

The language compilers are at various design levels providing maximum efficiency and flexibility. All compilers function with any control program configuration with the exception COBOL E and Assembler E under MVT. All OS/360

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compilers provide upward compatibility within each language. Main storage requirements for compilers stated in the system requirements section are in addition to the main storage required by the control program.

PL/I (360S-ML-511)

PL/I SUBROUTINE LIBRARY (360S-LM-512)

PL/I extends the range of applications that can be handled by a single high level language. In addition to covering problems similar to FORTRAN and COBOL, PL/I also covers problem areas beyond the scope of each, where past applications efforts have required the use of assembly language. Many features provided simplify programming of both commercial and scientific applications and assist the programmer in making efficient use of the supervisor facilities of OS/360. In terms of function, PL/I is the most complete high level language ever developed.

FEATURES -

- Many data types including fixed and variable length character and bit strings, floating decimal and binary data, fixed decimal and binary data and complex numeric data.
- Complex data and arithmetic capability include expressions whose elements are scalars (individual numeric items), structures (collection of alphameric field,) and arrays - (tables).
- Program segmentation capability providing for modular program structure.
- Automatic conversion and editing of data types where necessary.
- Initialization of data elements and arrays.
- Dynamic storage allocation under user control permitting more efficient use of variable size data areas.
- Source program debugging facilities including an option for a source statement number reference during executing, indication of variable names and values, and optional checking for unusual conditions.
- Time recording for compilation.
- Stream input/output (an extension of FORTRAN - like I/O).
- Record oriented input/output (an extension of COBOL - like I/O).
- Multitask capability under MVT is provided with appropriate control of posting and waiting upon task completion.
- Ability to change task priority under MVT during execution.
- Compile time facilities which allow analysis and modification of source programs and for the inclusion of source statements from libraries.
- Update mode for QSAM input/output.
- Sort capability.
- Advanced Checkpoint/Restart
- Statement number offset table
- Additional Keyword abbreviations
- String psuedo-variable
- ISAM variable length
- In line conversions
- Assignment Statement improvements
- Register Utilization
- PL/I Mathematical built-in functions

System Requirements for Compiling PL/I:

- Minimum of 44K bytes of main storage.
- Significant increases in compile performance result from the availability of more storage.
- Decimal and floating point instruction set options for compiling and executing all programs.
- CPU interval time and the OS timer control program option can be used.
- Data Management space and/or device allocation is required for:
 - Source program input (SYSIN).
 - Intermediate (work) storage (SYSUT1, SYSUT3,) optional.
 - Object modules (SYSLIN) optional.
 - Printed output (SYSPRINT).
 - Punched output (SYSPUNCH) optional.
 - Source (macro) library (SYSLIB) optional.

PL/I - F object programs can utilize the following OS/360 control program and Data Management services.

Data Management access methods available with PL/I:

- BSAM (unblocked, unbuffered, sequential files, record formats F, U, V).
- QSAM (blocked and/or buffered sequential files, record formats F, FB, V, VB).
- BISAM (blocked or unblocked files, formats F, FB).
- QISAM (blocked or unblocked, buffered files, formats F, FB)
- BDAM (unblocked, unbuffered files, formats F, U, V).

Control Program Services Directly available with PL/I:

Time of Day... Date... Storage Allocation (GETMAIN/FREEMAN)... Checkpoint (PCP only)... Return

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codes... EXEC card parameters (passed to PL/I program)... Multitasking (ATTACH, CHAP) (MVT only)... System console (write to operator with or without reply. Processing may continue while awaiting reply using I/O EVENTS)... Events (ECB's)... WAIT's (including multiple waits)... CALL/RETURN... Delay of task or step... Program check control (Cause of interrupt is made available to PL/I program via SPIE macro. ABEND will not occur)... ABEND... System core dumps (Programmer can control when a dump will occur and whether the current task or all active tasks will be dumped. Program may optionally proceed or ABEND after dump)...

The following OS/360 options are available to the PL/I user via EXEC cards or SYSGEN options.

- Storage size (specific size or use what is available).
- Lines per page of output.
- Source program listing.
- Object program listing (simulated assembler listing).
- Listing of external references.
- Data item attribute listing.
- Cross reference listing.
- Object deck output.
- Object module (SYSLIN) output.
- NAME card output (for linkage editor control).
- Optimization levels 0, 1.
- BCD vs EBCDIC input.
- 48 or 60 character set input.
- Source program margin specifications (portion of card used for program vs page numbers or deck ID).
- Listing carriage control - skipping - spacing.
- Checkout option (provides for source statement numbers in object time diagnostics).
- Extended dictionary (permits users to compile very large programs).
- Nesting count (of DO-loops and blocks for source listing).
- Use of compile-time processor.
- Compile-time processor deck output.
- Level of diagnostics to be printed (at compile).
- Share Object Time library between concurrent jobs in several regions under MVT (Version 5).

Batch compilation and dynamic invocation of the PL/I compiler are supported.

The printed output produced by the compiler provides comprehensive aids to the programmer for development and maintenance of the PL/I program.

- Source program (before and/or after compile-time processing).
- Object program (simulated assembler listing associating source statements to output).
- Listing of options selected for compilation.
- Listing of external name references.
- List of data attributes, explicit or default for each data item.
- Cross reference listing.
- Terminal, severe and warning levels of diagnostics (sorted by statement number within class).
- Nesting levels of groups, blocks and procedures.
- Storage used by static and dynamic parts of program.
- Size of aggregates (in bytes) used in the source program.

FORTRAN G 360S-FO-520

FORTRAN H 360S-FO-500

OS/360 FORTRAN is compatible with and encompasses the United States of America Standards Institute (USASI) FORTRAN. The E Level language supports the USASI basic FORTRAN language. The G and H Level language supports the USASI FORTRAN language. The restrictions in FORTRAN E with respect to imbedded blanks and reserved words are under control of the user through the use of the ADJUST option. All three OS/360 FORTRAN compilers provide a compile time option which allows the introduction of source programs in either BCD or EBCDIC character codes (see note). The output of the compilers -- source listings and literal data in the object programs -- will utilize the original, untranslated character codes. At object time, literal A-format, and H-format input and output data will not be translated; D-, E-, F-, and I-format input data may be in either BDC or EBCDIC code representation.

NOTE - OS/360 FORTRAN H and G source programs in BCD must use 7090 FORTRAN syntax in those areas where the syntax differs from OS/360 FORTRAN syntax (for example, a dollar sign rather than an ampersand must be used in a CALL statement when presenting the statement number as an argument). The E Level subset provides language extensions beyond USASI basic FORTRAN including:

- Support of the direct (EDAM fixed length only) data method.
- Double precision arithmetic.
- Mixed mode arithmetic.
- Ability to replace the H FORMAT specification by substituting enclosing apostrophes.
- The T-specification, permitting printed output to begin

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at any print position.
- Arrays of up to three dimensions.
- P-scale factors in FORMAT statements.

MINIMUM SYSTEM REQUIREMENTS - All three compilers and object programs require Floating Point Arithemtic option. In addition to the OS/360 residence, space in auxiliary storage is required for the following data sets -- system input... two intermediate (E level work storage only, not required for G and H)... print output... punch output... object module (last three system requirements are selectable through JCL).

NOTE - In FORTRAN H if the XREF and/or EDIT option is used a data set for each option must be defined.

FORTRAN LIBRARY 360S-LM-501

The FORTRAN Library contains relocatable subprograms which can be called by FORTRAN object programs. This library, which includes subprograms for logarithmic, exponential, trigonometric and other mathematical functions, serves FORTRAN E, G and H.

GRAPHIC PROGRAMMING SERVICES FOR FORTRAN

The services consist of subroutines and functions that enable a FORTRAN programmer to create a display on one or more 2250 Display Units (Models 1 and 3) under PCP, MFT II, MVT or MVT. The displays produced consist of any figures that can be constructed with points, lines, or characters, including charts, circles, arcs rectangles, etc. The subroutines and functions available for use by the FORTRAN (Level E, G, or H) programmer are called the Graphic Subroutine Package (GSP). The subroutines are requested through use of CALL statements in a sequence that produces desired characters or graphic forms on the 2250 screen, and that provides two-way communication between the user's program and the 2250 operator (if desired). In producing desired displays, the subroutine automatically:

- Generate necessary graphic orders and data for the displays.
- Transfer the generated orders and data to the 2250 buffer for execution, relocating them as neceessary.
- Allocate, control, and protect sections of main storage and of the 2250 buffer as required by the user's graphic program.
- Diagnose asynchronous errors and accomplish necessary handling.

FEATURES -

- Two levels of graphic order and data grouping, each of which can be referenced as an entity:

 1. ELEMENT -- all orders and data produced by one call to to a GSP subroutine.
 2. SEQUENCES -- all orders and data produced by several calls to GSP subroutines.

- Acceptance of input data in any rectangular coordinate system; the data is scaled as appropriate for use by the graphic subroutine package.
- Provision for temporarily removing an image from a display while its associated orders and data are in the buffer, and later redisplaying the image.
- Modification of graphic orders and data produced by a single call wherever they are located (in main storage or in the buffer) by another call to the same subroutine.
- Display of alphameric characters using either the character generator feature of the 2250 or a series of lines called strokes.
- Capability to read information from the buffer into main storage.
- Capability to locate the position of the light pen on the screen even if the light pen is pointed at a blank of the screen.
- Capability to place a tracking symbol on the screen and follow its motion as it is moved by a 2250 operator with the light pen. (Restricted to 2250 Model 3).
- Allowance for in-buffer subroutines that can be repeatedly invoked through inbuffer linkage (restricted to 2250 Model 3).
- Ability to check the status of the program while it is being processed.
- Calling any of the subroutines from an assembler language program.
- Single and multiple queueing of attention information, and in-line processing of that information.

USAS II COBOL 360S-CB-545

USAS II COBLIB 360S-IM-546

The USA Standard COBOL Compiler for OS/360 contains significant new functions and facilities beyond those currently available in OS/COBOL F. The new compilers retain all the current System/360 COBOL capabilities.

Features...Cross reference listing...Condensed Procedure listing option...Individual options for Data Map and Procedure Map.

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Conversion Aids - A detailed list of differences between USA Standard COBOL and the current System/360 COBOL Compilers (D, E, and F) is contained in the Differences Manual.

Language Conversion Program (LCP) - Converts System/360 COBOL source programs to USA Standard COBOL source will be provided.

The differences between System/360 COBOL and USA Standard COBOL are largely syntactical in nature. The LCP's are provided to ease the conversion by reducing conversion costs and minimizing programmers involvement.

Input

The input to the LCP must be a System/360 COBOL source program which adheres to the appropriate COBOL specification. Will compile and execute correctly on the current compiler.

Output

The listing identifies all changes made to the original source program and flags the statements, if any, which require verification or remain to be manually converted.

The ICP will function of the following System/360 Models: Model 30, 40, 50, 65, 67 (in 65 mode), 75, 85 and 91. It requires a minimum of 17K of main storage (25K if Report Writer is used).

Equipment Configuration LCP...In addition to the features required for the operating system, the following features must be present: Commercial Instruction Set (Model 91, the decimal simulator)...Input Data Set - Source Program... Output Data Set - Corrected Source Program (user option) Listing Data Set...three Utility Data Sets - The Utility Data Set may be tape or disk, but they must all be the same device type.

OS/360 COBOL F Maintenance - The USA Standard COBOL Compiler replaces the OS/360 COBOL F. It retains all of the advanced features of COBOL F and includes new features contained within the Standard COBOL Language as well as new IBM extension enhancements will be considered for the USA Standard Compiler only.

COBOL F will continue to have normal maintenance for two years after the availability of OS/360 USA Standard COBOL before it is withdrawn. The object time library will be maintained for one additional year.

COBOL F Asynchronous Processing - Support for the Asynchronous (Random) Processing feature previously defined for OS/360 COBOL F will not be delivered because its definition is in conflict with the current CODASYL definition of the equivalent feature.

An Asynchroncus Task Group has been appointed by CODASYL and is engaged is a thorough review of the scope, language, and rules for the feature. The USA Standards Institute is expected to base its standardization of Asynchronous Processing upon the output of the CODASYL Task Group.

Equipment Configuration - The OS/360 USA Standard COBOL Compiler operates in a minimum of 80K bytes of storage. It makes use of additional storage up to that specified. It will operate under OS on Systems/360 Models 40, 50, 65, 67 (in 65 Mode) 75, 85 and 91.

In addition to the features required by the Operating System the following features must be present at compile time: The Commercial Instruction Set (decimal simulator on the 91)... Floating Point Arithmetic if floating point literals or calculations are used...Four Utility Data Sets on 2500 Tape Units, 2311 Disk Drives or 2314 Disk Storage Facility. One Utility Data Set must be on a 2311 or 2314.

Object Time Core Requirements - CPU must be large enough to contain the object program and the necessary control program The Commercial Instruction Set is required.

Object Program I/O - All devices supported by the current OS COBOL F Compiler, as of the availability of this compiler are supported.

COBOL E 360S-CO-503

COBOL F 360S-CB-524

Operating System/360 COBOL (E) is a commercially-oriented programming language similar in form to English. It provides a number of features that reduce the cost of programming and extend the use of the language to new applications. COBOL E provides a number of IBM extensions to the standard language, increasing its power and scope. The COBOL E features include:

- The ORGANIZATION clause - to specify Indexed, Direct or Relative file organization.
- Floating-point items and literals, internal and external.
- The Linkage Section of the Data Division - to describe data passed from another program.

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- The IF overflow-name test condition.
- The REWRITE statement - to update on a direct-access file.
- The TRANSFORM statement.
- The debugging language.
- The Sterling Currency feature.
- The RECORD KEY clause - for accessing files whose organization is indexed.
- The TRACK-AREA clause - for adding records to a file whose organization is indexed.
- The FILE-LIMIT clause - for files whose organization is direct.
- The RERUN clause for checkpoint restart capabilities.

MINIMUM SYSTEM REQUIREMENTS - The COBOL E compiler and object programs require the Standard Instruction Set and the Decimal Arithmetic option. If floating-point literals, data items, or non-integer exponents are used in the object program, both the compiler and object program will require the floating-point feature. The minimum core requirement of COBOL E is 17K bytes.
COBOL E requires, in addition to the standard Operating System/360 DASD system residence, the following data sets:

- System input - for source programs.
- Working Storage - three intermediate utility data sets on devices of the same type.
- System output - for listings, maps, and messages.
- Either object module or punch output.
- COBOL source COPY library (optional).

COBOL F implements all the features of COBOL E, plus the following:

- The CORRESPONDING option of ADD, SUBTRACT, and MOVE statements.
- The Report Writer feature.
- The Sort feature.
- Implied Subjects and relational operators in compound conditions.
- The SPECIAL-NAMES paragraph.
- Mnemonic-name options for ACCEPT and DISPLAY.
- Improved NO REWIND and LOCK options for CLOSE.
- The Extended Source Program Library facility.
- The TRY option of the debugging language.
- Implied qualification of procedure-names.
- Two or more data-names associated with EXHIBIT.

MINIMUM SYSTEM REQUIREMENTS - The COBOL F compiler and object programs require the Standard Instruction Set and the Decimla Arithmetic option. If floating-point literals, data items, or non-integer exponents are used in the object program, both the compiler and object program will require the floating-point feature. The minimum core requirement for COBOL F is 80K bytes. COBOL F requires, in addition to the standard Operating System/360 DASD system residence and the COBOL E requirements one additional intermediate utility data set. Of these four data sets at least one must be on a DASD device.

COBOL E LIBRARY 360S-LM-504

COBOL F LIBRARY 360S-LM-525

The COBOL E Subroutine Library consists of subroutines which fall into the following major categories: Conversion routines... Arithmetic verb routines... Input/output verb routines... Other verb routines...

The COBOL F Subroutine Library includes all the COBOL E subroutines plus sort feature interface routines. These subroutines are included, if necessary when the object program is linkedited.

ASSEMBLER F 360S-AS-037

The OS/360 Assembler language permits the solution of problems to be expressed in convenient statements. Both assemblers provide essentially the same language features, macro instruction capability, functions, and data management support. The major differences are in performance; Assembler F uses larger work tables and has fewer phases tha Assembler E, and is therefore faster. Both assemblers will take advantage of additional available main storage by expanding the size of certain tables constructed during the assembly process.

Macro Instructions - The macro instruction capability provided by OS/360 assemblers is a powerful programming tool. It is flexible and easy to use, and permits new language capabilities to be defined as new or expanded applications are developed.

Conditional Assembler Statements - Conditional assembly statements can be used within a macro definition or in a source program to alter the sequence in which statements are processed, or to specify selective assembly of instructions.

Private Libraries - A private library may contain assembler language statements to be called by the assembler COPY instruction and/or the user's private macro definition.

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Pseudo-Registers in Assembler F - Multiple common areas may now be shared between separately assembled subroutines that are processed together by the linkage editor. Space for each uniquely named common area is assigned dynamically at problem program execution time.

MINIMUM SYSTEM REQUIREMENTS - All assemblers use the Standard Instruction Set. Object programs may use any instruction set. The minimum storage requirement for Assembler E is 18K bytes; Assembler F is 44K bytes. In addition to the standard OS/360 requirements the assemblers require space in auxiliary storage for the following data sets: System input... Three intermediate (work storage)... Macro instruction library (this optional requirements may be satisfied by DASD system residence or private library)... Print output -- Selectable through JCL... Object module -- Selectable through JCL... Punch output -- Selectable through JCL.

NOTE - Assembler E does not support both object module and punch output during the same assembly.

REPORT PROGRAM GENERATOR (RPG) 360S-RG-038

The Operating System/360 Report Program Generator provides a powerful, high level, problem-oriented language which offers the user many advantages and functions beyond those of the prior RPG's.

FEATURES - Outstanding improvements include:

- Translation directly to object module code.
- Modification specification sheets for easier coding.
- Simple re-education requirements for use of prior RPG's.
- Obtain data records from single or multiple input data sets.
- Create formatted printed reports.
- Perform calculations on data from input records or program created constants.
- Do table lookup.
- Ability to control operation with the use of indicators.
- Branch within calculations.
- Sequence check input records.
- Edit output reports.
- Operate on split control fields.
- Provide sterling conversion and inverted print edit.
- Ability to process records using QSAM.
- Update in place.
- Create new data sets.
- Use of direct access method.
- Use of Indexed Sequential Access Method.

MINIMUM SYSTEM REQUIREMENTS - The OS/360 RPG requires the standard instruction set and the decimal arithmetic option. The minimum main storage requirement is 15K bytes. In addition to the standard system residence, space is required in auxiliary storage for: System input... Three intermediate (work storage) all on tape or all on disk... Print output -- Selectable through JCL... Either object module or punch output -- Selectable through JCL.

ALGOL F COMPILER 360S-AL-531

ALGOL F LIBRARY 360S-LM-532

LANGUAGE FEATURES - OS/360 ALGOL is a proper subset of ALGOL 60. It encompasses the ECMA subset of ALGOL as well as the IFIP subset. The recursive use of procedures and recursively defined procedures are features provided beyond the ECMA Subset. In addition to the IFIP Input/Output procedures, the following facilities are available: Store and retrieve intermediate data... Set and access system parameters... Read and write integers, integer arrays, Boolean values, and Boolean arrays... Output character strings.

MINIMUM SYSTEM REQUIREMENTS - Both the compiler and generated object program require Floating Point Arithemtic option. In addition the the normal OS/360 system residence requirement, space in auxiliary storage is required for three intermediate (work storage) data sets of which one must reside on DASD. ALGOL support exists under all three supervisors (PCP/MFT/MVT).

The sequential access methods BSAM and QSAM are used by the compiler. The compiler object programs use BSAM only.

OPTIONS - The follwing compile time options may be specified: Single or double precision of floating point numbers... Full compilation or syntax checking only... Compilation of program or procedure... compiler output options like source listing, storage listing, storage maps, object module deck... source code in EPCDIC or DIN/ISO.

SERVICE PROGRAMS

OS/360 service programs provide functions ranging from standard utility services to program module linking and editing, remote job entry, graphic job processing and an extremely flexible sort/merge.

SORT/MERGE 360S-SM-023

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The OS/360 Sort/Merge is designed to satisfy the sorting and merging requirements of both tape-oriented and DASD-oriented installations. It is a generalized program that will use different sorting and merging techniques, depending on the control information supplied by the user, on the main storage and on the secondary storage devices available to it. The minimum main storage requirement is 17K bytes. Additional main storage will be used, if available, for performance improvement.

FEATURES -

- Sorting or merging on as many as sixty-four control data fields.
- Collating sequences and data format can be specified separately for each control field.
- Device independent initial input and final output.
- With additional main storage, as many as 32 tape units or 6 access mechanisms on DASD's can be used for intermediate storage, as well as multiple input and output devices.
- An advanced sorting technique on larger tape systems with the 2816 Switching Unit.
- Callable through COBOL, Assembler Language and PL/I.

MINIMUM SYSTEM REQUIREMENTS - In addition to the standard system residence, the Sort/Merge requires, as a minimum, devices for each of the following:
- System input.
- Three intermediate storage (same device type) - 3 tape units or one DASD.
- Initial input and final output (may be the same device) or the input device may also be used for intermediate storage.

Devices for intermediate storage can be any one of the following: 2400 Series Magnetic Tape Units... 2311 Disk Storage Drive... 2301 Drum Storage... 2314 Direct Access Storage Drive...

NOTE - 9- track input requires 9-track for output, and, if tape is used, 9-track tape for intermediate storage. If 7-track input is used, any combination of 7- and 9-track tape may be used for output or for intermediate storage. The 2321 Data Cell Drive is not supported as a sort work file.

LINKAGE EDITOR F 360S-ED-521

The linkage editor combines separately assembled or compiled object modules into one or more load modules that is in a format suitable for loading by the control program, and subsequent execution. It also combines previously edited load modules with each other or with object modules. Linkage Editor F (44K, 88K, 128K) offers functions not available with E (15K) or E (18K) related to input and output blocking and the number of entries in certain table structures. The 15K design for Level E has a larger capacity than the 18K with the 18K design providing faster performance. For Linkage Editor F, in a given amount of available main storage, the 44K design provides capacity, the 88K design speed and the 128K offers the best overall performance.

FEATURES - Although linking or combining of program is its primary function, linkage editor also:

- Incorporates modules from data sets other than those in its primary input, either automatically or upon request.
- Constructs an overlay program for loading by the control program.
- Aids program modification by replacing and deleting control section as directed by linkage editor control statements.
- Defines the storage requirements for the common control sections generated by assemblers and FORTRAN compilers, and the static external areas generated by PL/I compilers.
- Provides processing options and logs diagnostic error messages.

MINIMUM SYSTEM REQUIREMENTS - The minimum main storage requirement for Linkage Editor E is 15K bytes, and 44K for Linkage Editor F. In addition to the standard system residence, the linkage editor requires space in auxiliary storage for at least the following data sets:

- System input.
- One intermediate - requires DASD.
- Print output - selectable through JCL.
- Output load module - requires DASD.

There may also be one or more library data sets containing object or load modules requiring DASD, and one or more object module data sets as additional input.

REMOTE JOB ENTRY 360S-RC-536

OS/360 Remote Job Entry allows OS/360 jobs to be entered from remote locations using binary synchronous communications. Output may be returned to the remote working submitting the job, to another remote control

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station, or at the central computer. A job entry control language (JECL) is provided for operator communication and control. It features:

- System/360 using BOS or BPS, an 1130 Computing System Model 20, or 2780 Data Transmission Terminals may serve as remote stations.
- The 1130 and Model 20 Work Stations can share the same non-switched multipoint line.
- The System/360, Model 20 and 1130 Work Stations can use the same switched network connection (phone number) at the RJE central computer. (Not supported in WTC).
- Uses the new binary synchronous communication system.
- Provides completely automatic scheduling, initiation, execution, and output of job data.
- Notifications of forms change requirements.
- System restart.
- Uses BTAM with error recovery procedures.
- Started and stopped like OS/360 readers and writers.

MINIMUM SYSTEM REQUIREMENTS - Operates under the MFT or MVT control program. MFT or MVT device requirements apply. In addition, a 2701 or 2703 equipped with appropriate features for binary synchronous communication in EBCDIC transparency mode, and direct access storage space sufficient for storage of tables and work queues is required. Space is dependent on application, but will normally not exceed one 2311 Disk Storage Drive.

Dependent upon other installation requirements the MFT option may permit installation of RJE in a system having 256K of main storage.

GRAPHIC JOB PROCESSOR 360S-RC-541

This processor allows an application user, such as an engineer, to conveniently initiate and control jobs directly from the 2250 Display Unit. The jobs may either be graphic in nature andutilize the 2250 or may be requests for batch processing. The Graphic Job Processor allows the user to LOG ON, SPECIFY JOB STEP, DESCRIBE DATA, BEGIN JOB, BEGIN PROCEDURE, WRITE MESSAGE ENTER DATA, CANCEL JOB, RECALL and LOG OFF. GJP is supported under MFT or MVT. The system requirement is the 2250 Display Unit, Model I or Model III equipped with a minimum of 4096 bytes of buffer storage, the alphameric keyboard, and the character generator.

SATELLITE GRAPHIC JOB PROCESSOR

The Satellite Graphic Job Processor (SGJP) is an extention of the Graphic Job Processor and provides similar facilities. It enables an application user, such as an engineer, to request the initiation of System/360 jobs from the 2250-4 attached to his 1130 computer. He can initiate an OS/360 job to run in conjunction with a related 1130 program. Once the programs are initiated they can utilize the FORTRAN Data Transmission Subroutines to transmit control information and data between a program and each processor. He may also request that a program be initiated in the background job stream of OS/360. SGJP is presently supported under MFT and MVT.

TESTRAN AND TESTRAN EDITOR 360S-PT-516

TESTRAN statements can be grouped or interspersed in source modules and will be identified by the assemblers. The assemblers will produce from them a separate, replaceable control section which can be deleted by the linkage editor. These statements can also be assembled separately and link edited with a program to be tested. The TESTRAN editor processes the data placed in auxiliary storage by TESTRAN during a preceding text execution of a load module. It edits and prints the data in a format indicated in the symbol table produced by the assembler, unless an overriding format has been specified through TESTRAN macro instructions.

The time used to process test output is minimized by:

- Preventing runaway execution by allowing limits to be placed on the quantity of test output and the number of TESTRAN macro instructions.
- Allowing selective editing and printing of tests results according to any of eight priority categories designated by the programmer.
- Allowing test output editng and printing at any convenient time after test execution.

MINIMUM SYSTEM REQUIREMENTS - The minimum main storage requirement is 18K bytes. Space is required in auxilary storage for the following data sets: System input... Print output... Test results from interpreter... One intermediate - requires DASD...

OS/360 UTILITIES 360S-UT-506

The Operating System utilities operate with the control program and provide the following features:

- Moving and copying a data set or part of a data set from one volume to another.
- Moving a data set from one locating to another on the

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same volume.
- Unloading a data set onto a removable volume and loading it at a later time to a device of the same type as the original.
- Copy, move, load and unload functions can be accomplished on groups of data sets cataloged under common high level qualifiers.
- Printing or punching a data set, and printing information contained in the catalog or volume table of contents.
- Generating a data set based upon the contents of a sequentially organized input data set. Fields within records may be repositioned and/or converted as specified accounting to programmer specifications.
- Updating source language modules and the macro instruction library.
- Building and modifying the catalog data set.
- Analyzing the contents of the system library when updating is required and creating appropriate control statements for system maintenance.
- Unloading disk resident data sets to 7-track tape.
- Permitting inclusion of a control character in each logical record which controls printer carriage spacing when the data set is printed.
- Tape volume label creation.
- Unloads an indexed sequential data set to a special format sequential data set and reloads the indexed sequential data set at a later time.
- Record overflow support in the Move/Copy Utility.
- Initialize and assign alternate tracks to a direct access volume; dump and restore the data contents of a direct access volume.

MINIMUM SYSTEM REQUIREMENTS - The Operating System utilities require the standard system residence device and space on the auxiliary storage for the following data sets:

- System input.
- Intermediate storage (varies with utility).
- Print output.

In addition to the OS utilies, a number of independent utilities (360S-UT-507) are provided:

- The independent utilities do not operate with the control program, but they support the operating system with the following services:
- Initializing DASD's by writing home addresses and record zero for each track, checking for defective tracks, initializing tracks to zero, and writing volume tables of contents.
- Unloading and loading data between DASD and a removable volume.
- Recover/Replace Utility--This utility attempts to read data from a bad track and after the operator has corrected the data, replaces it on an alternate track of the direct access device.

7094 INTEGRATED EMULATOR FOR THE SYSTEM/360 MODEL 85 UNDER OPERATING SYSTEM/360:

An integrated emulator program that executes as a problem program under the System/360 Operating System, MFT or MVT version, in conjunction with the 7094 Compatibility Feature (#7119). The integrated emulator program and the Compatibility Feature, referred to as the Integrated Emulator, executes 709, 7090, 7094 and 7094II programs. The Integrated Emulator takes advantage of the multiprogramming facilities of the System/360 Operating System. Other problem programs, such as compilers, utility programs, user jobs, real-time applications, or other 7094 integrated emulators, can be executed concurrently in main storage. It allows the user to apply his programming resources toward developing new applications, and redesigning existing applications to take advantage of System/360 facilities. Both 7094 and System/360 jobs can be placed in a single input job stream for processing, provided the input does not contain binary data. Most currently-operating, non-time-dependent 7090 series programs can be executed without modification; however, certain devices and special features are not emulated. Performance of the Integrated Emulator varies according to the instructions used and the I/O activity of the emulated 7090 series program. The average internal speed of the Integrated Emulator when it is executing non-I/O instructions is approximately twice that of the 7094II.

MINIMUM SYSTEM REQUIREMENTS - The 7094 Integrated Emulator Program requires any System/360 Model 85, the 7090 Compatibility Feature (#7119), devices required for the operating system, and one System/360 device for each emulated 7094 device. All card read punch units used to read in binary data must be equipped with the Card Image feature, and all tape drives used for 7094 compatible tapes, (i.e., readable by the 7094 system) must be equipped with the Seven-Track Compatibility feature.

709/7090/7094/7094II	MODEL	SYSTEM/360	MODEL
7100 Proc. Unit(7090)	1	2085 Processor Unit	Any
7110 Proc. Unit(7094)	1	With 709/7090/94/94II Compatibility	
7111 Proc. Unit(7094II)	1		
7109 Arith.Seq. Unit	1	Functions provided	

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		by 2085
7302 Core Storage	1,3	2365 Processor Storage 5 2385 Processor Storage 1,2
7607 Data Channel(s)	1,2,3,	2860 Selector Channel(s)
Chan.8 thru H supported	4,5	2870 Multiplex Channel(s)
729 Tape Unit	2,4,5, 6	Any tape unit supported by the operating system sequential access method
711 Card Reader	2	Any card reader with Card Image feature or SYSIN device supported by the operating system sequential access method
716 Printer	1	Any printer or SYSOUT device supported by the operating system sequential access method
721 Card Punch	1	Any card punch with Card Image feature or SYSOUT device supported by the operating system sequential access method. If SYSOUT is used, the user must write his own SYSOUT writer to punch binary data.

Any 7094 feature or device not listed, is not supported. 704 mode is not emulated.

RECOVERY MANAGEMENT AND DIAGNOSTIC AIDS

RECOVERY MANAGEMENT FOR MVT AND MFT - MODEL 65 360S-DN-539

The Recovery Management programs attempt to recover from and/or otherwise reduce the impact of machine malfunctions indicated by a machine-check or channel-check interruption. It features transparent recovery with a successful retry, continuation if error is non-recoverable but job or task can be terminated and comprehensive environment records recorded. CPU, main storage and channel error recovery are separate independent SYSGEN options. This support does not include the Model 67 in 65 mode.

ON-LINE TEST EXECUTIVE PROGRAM (OLTEP) 360S-DN-533

The on-Line Test Executive Program (OLTEP) is an optional function that provides on-line facilities for: Ascertaining the condition of an I/O unit, complementing off-line repair facilities by providing program assistance to aid in defining the cause of a malfunction and making certain adjustments, and verifying the repair prior to assigned use by the system. These on-line facilities require one partition. The OLTEP is loaded via JCL statements. The unit tests as they become available, can be obtained from your local CE on magnetic tape or cards. Prior to use in the system, therefore, they must be translated to load module format in a partitioned data set (CLTEP). OLTEP and the unit tests will be executed in problem program states. Integrity of customer data is provided for with all tests. Console communication facilities are provided to define the job, initiate and terminate the test.

OS/360 SERVICE AIDS 360S-DN-554

The OS/360 Service AIDS are a group of programs designed to improve the serviceability of the Operating System. They provide several previously unavailable methods for diagnosing and correcting problems.

MINIMUM SYSTEM REQUIREMENTS

The following table shows the required system elements and the device types which may be used for each function:

System Function	Units Permitted
Processing Unit	S/360 Models 30,40,50,65,67 (65 mode),75 85,91 with main storage of 64K bytes or more for PCP, 128K bytes or more for MFT and 256K bytes or more for MVT (Note 4).
System Console	1052/2150 (Note 3)
Card Input Unit	2540, 1442-N1, 2501, 2520 or magnetic tape (Note 1)
Punch Output Unit	2540, 1442-N1 (a single 1442 cannot be both input and output) 1442-N2, 2520 or magnetic tape (Note 1)
Printer Output	1403, 1404 (continuous forms only), 1443 or magnetic tape (Note 1)
Generating Sys.Res.	2311, 2314, 2303, or 2301
Generating Sys.Res.	2311, 2314, 2303, or 2301 (different unit from generating system residence).
Two intermediate (work) data sets (direct access is required).	2311, 2314, 2301, or 2303, (Note 2)

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Two intermediate (work) data sets (sequential).	2311, 2314, 2301, or 2303, or magnetic tape (Note 1).

Notes:

1. Magnetic tape unit may be 2400 9-track, or 2400 7-track with Data Conversion feature (#3228 or #3236). Multiple functions not permitted on a single tape drive.

2. These intermediate (work) data sets normally will be placed on the same DASD as the generating system residence.

3. The required console is a 1052 which may but need not be connected via a 2150. (A composite console may be substituted for the 1052). Other system consoles are permitted with Multiple Console Support (See"Console Support").

4. The practical main storage requirement is a function of user options and application requirements. Caution should be exercised to ensure that sufficient storage exists for proposed configurations.

FEATURE SUPPORT:

The following features, are supported by OS/360. Other features, not listed, have no specific programming support; their existence is ignored by the control program. For brevity, this list does not include those basic features or control units which are required to connect a supported device.

CPU Features:

Decimal Arithmetic (#3237)-used by some compilers... Floating Point Arithmetic (#4427)-used by some compilers... Interval Timer (#4760)-used with Timer Option... Selector Channels (#6960,#6961,#6981,#6982)... and Storage Protection (#7520).

I/O Features:

1403 Printer
Universal Character Set feature (#8641,Mdl 2; #8640, Mdl 3, N1)
1442 Card Read Punch mdl N1
Card Image (#1532). For problem program use only.
1442 Card Read Punch mdl N2
Card Image (#1531).
1443 Printer mdl N1
24 additional print positions (#5558).
2540 Card Read Punch
Card Image (#1531)
2520 Card Read Punch
Card Image (#1531)
2501 Card Reader
Card Image (#1531)
2520 Card Punch
Card Image (#1531)
2314 Direct Access Storage Facility
Feature #8170 Two Channel Switch
2400/2415 Magnetic Tape Units and 2803 Tape Control mdl 2
Dual Density 800-1600 bpi (#3471 and #3472).
2401,2402 Magnetic Tape Unit Models 1,2,3,4,5,6.
2403,2404 Magnetic Tape Unit and Control Models 1,2,3,4,5,6.
2415 Magnetic Tape Unit and Control Models 1,2,3,4,5,6.
2420 Magnetic Tape Unit Models 5 and 7.
2701 Data Adapter Unit
Feature #1302 and #1303 Automatic Call.
Feature #4656 and #4657 with IBM Terminal.
Adapter III to attach 2848 (Remote).
2701 Synchronous Data Adapter-Type II (#7698,#7697,#7699)... EBCDIC #9060, USASCII #9061, 6-bit Transcode #9062, Dual Communications Interface (#3463,#3464,#3465), Transparency #8029, Auto Call #1314, Dual Code #3455.
2702 Transmission Control Unit
Feature #1290 Automatic Call Adapter, available in BTAM and QTAM. Feature #1319 Autopoll.
2703 Transmission Control Unit with Synchronous Base Type I (#7703, #7704)... Synchronous Terminal Control EBCDIC #7715, USASCII #7716, 6-bit Transcode #7717, Full Transparency for USASCII #9100, Auto Call (#1340, #1341).
2740 Communications Terminal
Dial Up feature #3255 (Optional)... Record Checking feature #6114 (Optional)... Station Control feature #7479 (required for multi-drop operation)... 2760 Attachment (#8301).
2760 Optical Image Unit
Requires 2740 mdl 1 with Record Checking (#6114 and 2760 Attachment (#8301). Optional features on the 2740 are Dial Up (#3255) and/or Automatic EOB (#1313).
2780 Data Transmission Terminal
Multipoint Line Control #5020, Automatic Answering #1340, Multiple Record Transmission #5010, Automatic Turnaround #1350, EBCDIC Transparency #8030, 6-bit Transcode #9760, USASCII #9761, EBCDIC #9762.
2803,2804 Tape Control Model 1, 2
Simultaneous Read-While-Write (#7160, #7161).
Data Conversion (#3228,#3236)-Required for all 7-track tapes that record binary data such as variable length

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(format V) records and abnormal end dumps.
7-track Compatibility (#7125, #7126, #7127, #7135).
16 Drive Addressing (#7185).
2420 Attachment (#7900) to the 2803 Model 2
2816 Switching Unit Model 1. All features for additional switching (#1050,#1051,#1052,#1055,#2285,#2286,#4455, #6392,#6393).
2821 Control Unit Model 1, 4, 5.
Column Binary (#1990). For program use only.
Universal Character Set Adapter (#8637,#8638,#8639).
2841 Storage Control Unit
Feature #6118 Record Overflow,
Feature #8100 Two-Channel Switch.
2844 Auxiliary Storage Control
Feature #8171 Two-Channel Switch.

2870 Multiplexer Channel - Excludes:

1. Burst devices (including byte devices with burst mode options operating in burst mode) on a multiplexer subchannel. The 2321 and magnetic tapes are supported on the selector subchannels.
2. Cross channel devices (2804 Tape Control, 2404 Magnetic Tape Unit and Control, 2816 Switching Unit, 2841 Storage Control with Feature #8100 Two Channel Switch) attached between any 2804 Tape Control, 2404 Magnetic Tape Unit and Control, 2816 Switching Unit, 2841 Storage Control with feature #8100 Two Channel Switch) attached between any 2870 subchannel and any other channel or subchannel.
3. SEP and AFF parameters for device allocation are not supported.

2848 Display Control

- Feature #4787 Line Addressing.
- Local Support - Graphic Programming Services.
- Remote Support - BTAM and QTAM

1130 System with Binary Synchronous Communcations Adapter #7690 in BSC mode.

DEVICE SUPPORT

I/O Unit Support: The following units to maximum of 248 devices are supported by OS/360 for the indicated function. (Under FUNCTION - The alphabetic character references the LEGEND section; the numeric suffix references the NOTES section).

INPUT/OUTPUT UNITS	FUNCTION
1403 Mdls N1, 2, 3, 7	C2, F5, H2
1404 Mdl 2 (Continuous Forms only)	C2, F5, H2
1442 Mdl N1	A3, C3, F5, H
1442 Mdl N2	C, H
1443 Mdl N1	C, F5, H
2150	F
2250 Mdls 1, 3	F12, G
2260	G
2280	G15
2282	G15
2301 Mdl 65,75,85,91 only (NOTE 9)	A1, B, D, E, H, I, J, K
2302 (NOTES 4 and 9)	E, H, I, J, K
2303 (NOTE 9)	A1, B, D, E, H, I, J, K
2311 (NOTES 7 and 9)	A11, B, D, E, H, I, J, K
2314 (NOTES 7 and 9)	A11, B, D, E, H, I, J, K
2321 (NOTE 9)	A1, E14, H, I, J, K
2400	A, C, H
2415	A, C, H
2420	A, C, H
2501	A, F5, H
2520	A3, C3, C8, F5, H3
2540	A6, C6, C8, F5, H
2671	H
2740	A, C
2741	A, C
2780 Mdls 1, 2 (EBCDIC Transparency only)	A10, C10
1050	A, C
1130 (Computing System)	A10, C10
S/360- 25, 30, 40, 50, 65, 67 (65 mode), 75, 85	A10, C10

LEGEND:
A - Input Job Stream
B - MVT In/Out Work Queue
C - System Output
D - Primary SYSRES
E - Program Libraries
F - Console
G - Graphic Programming Services
H - Sequential Access Methods
I - Indexed Sequential Access Method
J - Basic Partitioned Access Method
K - Basic Direct Access Method

NOTES:
1 - MVT only.
2 - Selective Tape Listing feature is not supported
3 - Supported for read or punch, but not both simultaneously.
4 - Not supported by MVT.
5 - Console must consist of a printer-keyboard or a card reader and printer to simulate the actions of a printer-keyboard.

CONTINUED FROM PRIOR COLUMN

6 - Punch Feed Read is not supported.
7 - For message under QTAM.
8 - For use with MVT Output Writer; not for system messages.
9 - File Scan not supported.
10 - As a work station for MVT/RJE.
11 - MVT and MVT only.
12 - Model 1 only. Supports as a MVT Model 65 Multiprocessing Console under Multiple Console Support only.
13 - Supported only under Conversational RJE.
14 - Supported when attached to a selector channel or when attached to a selector subchannel only if PCI Fetch is not included in system.
15 - PCP and MFT for Models 50 and 65 only.

TELECOMMUNICATION DEVICE SUPPORT

Under the "DEVICE" heading, the alphabetic character references the "LEGEND"; the numeric suffix references the "NOTES".

PROGRAM SUPPORT	DEVICE
BTAM	Q, R, S, T, U2, V
Autopoll	Q3, S3
ERP	Q, R, S, T, U2, V
Error Count	Q, R, S, T, U2, V
On-line Terminal Test	Q, R, S, T, U2
BSC	W4, X4, Z4
S/360 to (6-bit Transcode)	Y4
S/360 to (EBCDIC)	Y4
QTAM	Q, S, T, U2, V
Autopoll	Q3, S3
2702 and 2703 (2740 Station Control or Station Control and Checking feature)	
ERP	Q, S, T, U2, V
Error Count	Q, S, T, U2, V
On-line Terminal Test	Q, S, T, U2
Operator Control	S
Checkpoint/Restart	Q, S, T, U2, V

SYSTEM GENERATION

This is the process of preparing a specially tailcred operating system to match the machine configuration and operating system options selected by the user. This process uses the Operating System and requires the following programs--

- Control Program
- Data Management: Data Set Control, BSAM, QSAM, BPAM
- Assembler
- Linkage Editor
- Utilities

PID will include the required libraries (Partitioned Data Sets) which contain the Operating System modules and the system generation macro-instructions needed for the system generation process when the above programs are ordered.

- System Requirements -- The minimum main storage requirement, including the resident control program nucleus, is 64K bytes. The Operating System requires a minimum of one DASD but, for SYSGEN, two 2311 disk storage drives are required, plus three 1316 disk packs.

- System Maintenance -- The same "system requirements" are required for maintenance as for generations since some changes may require a new system generation.

STARTER SYSTEM

2311 RESIDENCE 360S-CI-514

2314 RESIDENCE 360S-CI-534

To assist users in performing their initial system generation, a standardized "starter" operating system is available with distribution of program materials from PID.

The Starter system has the basic element necessary for system generation, in a form that will be directly usable by a majority of customers. The starter system will function with a variety of different I/O units at "standard" addresses. Customers may use the starter system to perform system generation if there are appropriate matching units and addresses in their own configuration. The Starter System operates on a System/360 having 64K or larger storage. Customers whose configurations do not match closely enough to permit system generation should plan to do their initial system generation on some system having OS/360 already installed.

BASIC PROGRAM PACKAGE

DOCUMENTATION - The following SRL publications and documentation appropriate to the components ordered

CONTINUED FROM PRIOR PAGE

will be shipped by PID with each initial order.

SRL Publications	Form No.
ALGOL Programmer's Guide	C33-4000
Assembler F Programmer's Guide	C26-3756
COBOL F Programmer's Guide	C28-6380
Concepts and Facilities	C28-6535
Job Control Language	C28-6539
Operator's Guide	C28-6540
OS/360	C28-6719
Release 19 Guide	C28-6733
Operators Procedure	C28-6692
Job Control Language Reference	C28-6704
1285,1287,1288 Data Management Macro Instructions and Services	C21-5004
1419/1275 Data Management Macros and Services	C21-5009
OS/360 CRJE Concepts and Facilities	C30-2012
OS/360 CRJE Terminal Users Guide	C30-2014
OS/360 CRJE System Programmers Guide	C30-2016
System Programmer's Guide	C28-6550
Storage Estimates	C28-6551
System Generation	C28-6554
System Control Blocks	C28-6628
Messages and Completion Codes	C28-6631
Programmer's Guide to Debugging	C28-6670
Advanced Check Point Restart	C28-6708
COBOL E Programmer's Guide	C24-5029
BTAM	C30-2004
QTAM Message Control Programs	C30-2005
QTAM Message Control Processing Program	C30-2003
On-Line Test Executive Program	C28-6650
Supervisor and Data Management Services	C28-6646
Supervisor and Data Management Macro Instructions	C28-6647
Graphic Programming Services For 2250 Display Unit	C27-6909
Graphic Programming Services for 2260 Sub-Programs	C27-6912
1130 System Introduction	C26-3709
FORTRAN Library Sub-programs	C28-6818
PL/I F Comp Subroutines	C28-6590
1130 Programmer's and Operator's Guide	C26-3717
1130 Subroutine Library	C26-5929
Graphic Programming Services for FORTRAN IV	C27-6932
Data Transmission for FORTRAN	C27-6937
PL/I F Programmer's Guide	C28-6594
TESTRAN	C28-6648
Remote Job Entry	C30-2006
User's Guide for Job Control From the 2250 Display Unit	C27-6933
SGJP User's Guide	C27-6938
Sort/Merge	C28-6543
Maintenance	C27-6918
Utility Programs	C28-6586
FORTRAN G and H Programmer's Guide	C28-6817
Release Guide	C28-6718
USAS COBOL Programmer's Guide	C28-6399
Program Material List	
OS/360 Prose	
PTF write-up	

MACHINE READABLE - Object code for all components. The complete OS/360 is distributed in one package for the 2311 user and a different package for the 2314 user. Those who desire the 2311 package must specify Program Number Extension "2311". Those who desire the 2314 package must specify Program Number Extension "2314". Specify each component desired. Following is a list of available components, their Program Numbers and appropriate Program Number Extensions.

Program Title	Program Number	Program No. Extension
	360S	2311
ALGOL	AL531	
ALGOL Library	LM532	
Assembler F	AS037	
Basic Direct Access Method	DM509	
Basic Telecommunications Access Method	CQ513	
COBOL E	CO503	
COBOL E Library	LM504	
COBOL F	CB524	
COBOL F Library	LM525	
CRJE	RC551	
FORTRAN G	FO520	
FORTRAN H	FO500	
FORTRAN Library	LM501	
FORTRAN Syntax Checker	FO550	
Graphic Job Processor	RC541	
Graphic Program Services	IO523	
Graphic Subroutine Program	LM537	
Independent Utilities	UT507	
Indexed Sequential Access Method	IO526	
Linkage Editor F	ED521	
MVT	CI535	
OLTEP	DN533	
OS/360 Service Aids	DN554	
OS/360 Utilities	UT506	
PL/I F	NL511	
PL/I F Subroutine Library	LM512	

CONTINUED FROM PRIOR COLUMN

PL/I Syntax Checker	PL552
Primary Control Program	CI505
Primary Data Management	DM508
Queued Telecommunications Access Method	CQ519
Recovery Management Mod/65	DN539
Remote Job Entry	RC536
Report Program Generator	RG038
Satellite Graphic Job Processor	RC543
SER0, SER1 & ERUP for Mods 40,50,65,75	DN527
Sort/Merge	SM023
Starter System (2311 SYSRES)	CI514
TESTRAN	PT516
1130/360 Data Transmission	LM542
USA Standard COBOL	CB545
Loader	LD547
USA Standard COBOL Library	LM546

	360S	2314
ALGOL	AL531	
ALGOL Library	LM532	
Assembler F	AS037	
Basic Direct Access Method	DM509	
Basic Telecommunications Access Method	CQ513	
COBOL E	CO503	
COBOL E Library	LM504	
COBOL F	CB524	
COBOL F Library	LM525	
CRJE	RC551	
FORTRAN G	FO520	
FORTRAN H	FO500	
FORTRAN Library	LM501	
FORTRAN Syntax Checker	FO550	
Graphic Job Processor	RC541	
Graphic Program Services	IO523	
Graphic Subroutine Program	LM537	
Independent Utilities	UT507	
Indexed Sequential Access Method	IO526	
Linkage Editor F	ED521	
MVT	CI535	
OLTEP	DN533	
OS/360 Service Aids	DN554	
OS/360 Utilities	UT506	
PL/I F	NL511	
PL/I F Subroutine Library	LM512	
Primary Control Program	CI505	
Primary Data Management	DM508	
Queued Telecommunications Access Method	CQ519	
Recovery Management Mod/65	DN539	
Recovery Management Mod/65	DN539	
Recovery Management Mod/65	DN539	
Remote Job Entry	RC536	
Report Program Generator	RG038	
Satellite Graphic Job Processor	RC543	
SER0, SER1 & ERUP for Mods 40,50,65,75	DN527	
Sort/Merge	SM023	
Starter System (2314 SYSRES)	CI534	
TESTRAN	PT516	
1130/360 Data Transmission	LM542	
USA Standard COBOL	CB545	
Loader	LD547	
USA Standard COBOL Library	LM546	

OPTIONAL PROGRAM PACKAGE

DOCUMENTATION - Optional Program Material List.

MACHINE READABLE - The symbolic modules for OS/360 are available and are arranged in sequential data sets by component (except when one component exceeds 70,000 statements). The machine readable material is available on individual volumes (VOLs) as is indicated below:

Program Title	Program Number	Program No. Extension
	360S	VOL1
PL/I	NL511	
	360S	VOL2
PL/I (continuation)	NL511	
	360S	VOL3
PL/I Subroutine Library	LM512	
PL/I Syntax Checker	PL552	
	360S	VOL4
1130/360 Data Transmission	LM542	
FORTRAN G	FO520	
FORTRAN H	FO500	
FORTRAN Library	LM501	
FORTRAN Syntax Checker	FO550	
	360S	VOL5
USAS II COBOL	CB545	
USAS II COBLIB	LM546	
	360S	VOL6
COBOL E	CO503	
COBOL F	CB524	
COBOL F Library	LM525	
COBOL E Library	LM504	
ALGOL	AL531	
ALGOL Library	LM532	

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	360S	VOL7
Sort/Merge	SM023	

	360S	VOL8
Assembler F	AS037	
Linkage Editor F	ED521	
Loader	LD547	
OS/360 Utilities	UT506	

	360S	VOL9
IFSTRAN	PT516	
ETAM	CQ513	
QTAM	CQ519	
BDAM	DM509	
ISAM	IO526	

	360S	VOL10
Graphic Program Service	IO523	
Graphic Subroutine Program	LM537	
Primary Data Management	DM508	

	360S	VOL11
DMSERX	DM527	
On-Line Test Executive Program	DM533	
Recovery Management Mod/65	DM539	
OS/360 Service Aids	DM554	

	360S	VOL12
Primary Control Program	CI505	

	360S	VOL13
Primary Control Program (continuation)	CI505	
MVT	CI535	

	360S	VOL14
Remote Job Entry	RC536	
Graphic Job Processor	RC541	
SGJP	RC543	
Report Program Generator	RG038	
CRJE	RC551	
Recovery Management Mod/65	DM539	

	360S	VOL14
Remote Job Entry	RC536	
Graphic Job Processor	RC541	
SGJP	RC543	
Report Program Generator	RG038	

ORDERING INFORMATION: SYSTEM NUMBER 360S

Note: Both the basic and optional machine readable material for this system is ordered by specifying a "System Line" (Columns 1-7, 15-24) and "Component Lines" (Columns 8-12) of the Program Order Form. Enter a separate Component Line for each component desired. Respecify the System Line for each Program Number Extension.

	PROGRAM NUMBER EXTENSTION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	2311	MT	9/1600	29	01
		MT	9/800	28	02
		MT	7DC/800	26	02
		1316		52	05
	2314	MT	9/1600	29	01
		MT	9/800	28	02
		MT	7DC/800	26	02
OPTIONAL	VOL1	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL2	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL3	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL4	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL5	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL6	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL7	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01
	VOL8	MT	9/1600	29	01
		MT	9/800	28	01
		MT	7DC/800	26	01

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VOL9	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	26	01
VOL10	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	25	02
VOL11	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	26	
VOL12	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	26	01
VOL13	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	26	01
VOL14	MT	9/1600	29	01
	MT	9/800	28	01
	MT	7DC/800	26	01

ASSEMBLER E

BASIC PROGRAM PACKAGE
DOCUMENTATION - Assembler E Programmers Guide (GC28-6595) Assembler E Installation Guide (GC33-4014) including Basic Program Material List.
MACHINE READABLE - Object material for Assembler E.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Source material for Assembler E.

ORDERING INFORMATION: PROGRAM NUMBER 360SAS036

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	7DC/800	26	none
		DTR	9/800	28	none
		DTR	9/1600	29	none
OPTIONAL	none	DTR	7DC/800	26	none
		DTR	9/800	28	none
		DTR	9/1600	27	none

LINKAGE EDITOR E

BASIC PROGRAM PACKAGE
DOCUMENTATION - Linkage Editor and Loader (GC28-6538; Linkage Editor and Loader Installation Guide (GC28-6429) including Basic Program Material List.
MACHINE READABLE - Object material for Linkage Editor E.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Program Logic Manual and the Optional Program Material List.

MACHINE READABLE - Source material for Linkage Editor E.

ORDERING INFORMATION: PROGRAM NUMBER 360SED510

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	7DC/800	26	none
		DTR	9/800	28	none
		DTR	9/1600	29	none
OPTIONAL	none	DTR	7DC/800	26	none
		DTR	9/800	28	none
		DTR	9/1600	29	none

FORTRAN E

BASIC PROGRAM PACKAGE
DOCUMENTATION - FORTRAN E Programmer's Guide (GC28-6603) FORTRAN IV Installation Guide (GC28-6430) including Basic Program Material List; Basic FORTRAN IV Language (GC28-6629).
MACHINE READABLE - Object material for FORTRAN E.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - Optional Program Material List.
MACHINE READABLE - Source materia for FORTRAN E.

ORDERING INFORMATION: PROGRAM NUMBER 360SFO092

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	7DC/800	26	none

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	DTR	9/800	28	none
	DTR	9/1600	29	none
OPTIONAL none	DTR	7DC/800	26	none
	DTR	9/800	28	none
	DTR	9/1600	29	none

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360D-00.0.004
S/360 GANG-PUNCH UTILITY PROGRAM

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corp.
Data Center
570 Broad St.
Newark, N. J. 07102

*** N - - - - - - - - - ***

DESCRIPTION - This program will gang-punch as many duplicate cards as desired from the one master card which is entered immediately behind the program. The stop button is pressed when a sufficient quantity is duplicated. Program can be used for any general-purpose gang-punch application. One such occasion is to produce stacks of single program cards where all the basic punches are the same except for the first few columns into which is key punched the starting location and count information relevant to each specific job, as in the System/360 Core-punch, Core-load Utility Program (360D-00.0.005).

PROGRAMMING SYSTEMS - Written in machine language.

MINIMUM SYSTEM REQUIREMENTS - Any model S/360 with a 2540 Card Read/Punch on line.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.005
S/360 CORE-PUNCH, CORE-LOAD UTILITY

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corp.
Data Center
570 Broad St.
Newark, N. J. 07102

*** N - - 04.1 - - - - - ***

DESCRIPTION - This package contains two, two-card programs. One will punch out contiguous core at 80 bytes per card. The second program will load core contiguously from cards, 80 bytes per card. In both cases, the starting location and count are specified by the user in the first few columns of the program card. The punch program permits retrieving sections of core image libraries from various operating systems for modification, patching, or possibly for use as a stand-alone program when combined with a proper core-load program. The core-load program, after the last specified card is read in, branches to any address indicated by the user. Provision is also made to load a base register, if needed. The core-load program is also useful in loading and executing self-written machine language programs. It can also load tables, test data, etc. that are to reside in a certain section of core to be acted upon by some other program.

PROGRAMMING SYSTEMS - Written in machine language.

MINIMUM SYSTEM REQUIREMENTS - Any model S/360 with a 2540 Card/Read Punch on line.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.008
IBM OS/360 UNRAVL

AUTHOR: S. Spisak

DIRECT TECHNICAL INQUIRIES TO:
S. A. Zerof
University of Kentucky

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Computing Center
McVey Hall
Lexington, Ky. 40506

*** N - - 04.0 - - - - - - ***

DESCRIPTION - UNRAVL is a utility program which will analyze any FORTRAN IV program and produce a cross-reference dictionary with reference at the source level. Its output consists of (1) a listing of the program with each statement assigned a line number and (2) a listing of all variables and statement numbers appearing in the program. Each variable or statement number is followed by a list of all source statements which refer to it, the source statement being identified by line number.

UNRAVL is intended for use by programmers when debugging, maintaining or altering large programs. It may be used with any source deck but is not a compiler and does limited syntactical error checking. Since UNRAVL is not a compiler, the input deck does not need to be a complete program.

Any number of FORTRAN IV programs can be analyzed in one run. Size limitations are not restrictive since UNRAVL can handle a very large number of literal appearances of variables and statement numbers. Approximately 3,000 to 3,500 source statements can be UNRAVL'ed in one pass. Run time averages about 2-3 source statements per second of computer time on a Model 50.

PROGRAMMING SYSTEMS - Written in OS/360 FORTRAN IV and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360, 256K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.0.009
SYSTEM/360 REPRODUCE AND SEQUENCE-NUMBER UTILITY PROGRAMS

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corp.
425 Park Ave.
New York, N. Y.

*** N - - - - - - - - - ***

DESCRIPTION - This is a package of three 2-card programs. One will reproduce CC 1-74 of a master deck and sequence-punch numbers in CC 76-80 starting with 000010 and increasing by increments of 10. The second program will reproduce CC 7-80 and sequence-punch numbers in CC 1-6. The third program will reproduce CC 7-72 of the master deck, gang-punch constant identifying information into CC 73-80, and sequence-punch numbers into CC 1-6, starting with 000010 and increasing by increments of 10. The first program is good for sequencing or resequencing Assembler Language Source programs. The latter two will do the same for COBOL or similar language source programs. The incrementing factor as well as the starting point of selected columns can easily be changed by the user.

PROGRAMMING SYSTEMS - Written in machine language.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 with a reader and punch physically addressed as 00C and 00D respectively.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.010
RENUMBER - A SELF-RELOCATING UTILITY PROGRAM TO REPRODUCE AND RESEQUENCE ALL DOS/TOS ASSEMBLER LANGUAGE, COBOL, PL/I, RPG AND FORTRAN PROGRAMS.

AUTHOR: R. K. Goran

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DIRECT TECHNICAL INQUIRIES TO:
B. K. Goran
IBM Corp.
520 Boylston St.
Boston, Mass. 02116

*** N - - - - - - - - - - ***

DESCRIPTION - RENUMBER is a self-relocating DOS/TOS utility program which will resequence and reproduce source program decks written in the following DOS/TOS Languages - Assembler Language, COBOL, PL/I, RPG, and FORTRAN. Also, Assembler Language programs will have the Name, Operation and Operand fields realigned to columns 1, 10, and 16 where necessary along with continuation indicators in successive cards being sequentially numbered. Furthermore, ISEQ 73, 80 statements are inserted in the beginning of each assembler deck and all previous ISEQ statements are ignored. It is not necessary for the user to prepare any special control cards for input to RENUMBER nor is it necessary to remove any job control statements associated with the source program deck. The identification information for any of the five types of source programs is taken from the respective positions in the // EXEC translator statement.

MINIMUM SYSTEM REQUIREMENTS - Same as for DOS or TOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.011
PAPER TAPE INPUT AND EDITING PROGRAM (PTUT)

AUTHOR: P. J. Somerville

DIRECT TECHNICAL INQUIRIES TO:
P. J. Somerville
IBM Corporation
1 Katharine Street
Croydon, Surrey, United Kingdom

*** N - - - - - - - - - ***

DESCRIPTION - A versatile paper tape input and editing program designed around common problems associated with paper tape records, i.e. undefined length records and undefined length fields within the record. The program will read undefined or fixed length records via a 2671 and, via control cards supplied at execution time translate any code and generate fixed, variable or undefined format output records for different transaction types mixed in the input. There are extensive built-in editing functions, and user supplied routines may also be used. In its simplest form, paper tape may be read, translated and transferred to any output medium (tape, disk, card, printer) by supplying as few as 3 control cards.

PROGRAMMING SYSTEMS - Written in DOS/TOS Assembler Language and operates under DOS/TOS (IIOCS).

MINIMUM SYSTEM REQUIREMENTS - S/360 32K with Decimal Arithmetic and a 2671 together with the appropriate output units and I/O devices required by DOS/TOS. (It may easily be modified to run on a 16K machine).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.0.012
SERVICE AND UTILITY PROGRAM BY EXTERNAL REQUEST (SUPER 44)

AUTHOR: H. A. Garner

DIRECT TECHNICAL INQUIRIES TO:
H. A. Garner
IBM Corporation
2930 W. Imperial Highway
Inglewood, California 90303

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*** S ICC - 00.1 00.3 - - - - - ***

DESCRIPTION - This is a utility program which operates under control of System/360 Model 44 Programming System (44PS), and significantly extends the utility capability of that system. Devices supported include tape (nine and seven track), card equipment, printer, console and disk. Super 44 utilities may be run as a job through the jobstream, or may be entered through the console.

PROGRAMMING SYSTEMS - The Model 44 operating system required is Programming System (44PS).

MINIMUM SYSTEM REQUIREMENTS - Any S/360 Model 44 regardless of core size.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.0.013 *M
GRAPHIC REPRESENTATION OF OVERLAY STRUCTURE

AUTHOR: K. A. Gomas

DIRECT TECHNICAL INQUIRIES TO:
K. A. Gomas
IBM Dept. 655 - Time/Life Bldg.
1271 Ave. of the Americas
New York City, New York

*** N - - 04.0 10.3 - - - - - ***

DESCRIPTION - This program will create a graphic representation of the structure of an overlay program and optionally recreate a deck of sequentially numbered cards, which, when introduced to the linkage editor with the program (whose structure was created) will recreate the same precise structure.

PROGRAMMING SYSTEMS - Programming language - OS/360 Assembler Language, and the operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - 64K OS/360 oriented system with at least one disk file and 15K core storage available to this problem program.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.014
TPLAB/DLAB/XTENT TO TLBL/DLBL/EXTENT JOB CONTROL

AUTHOR: Clara L. Taylor

DIRECT TECHNICAL INQUIRIES TO:
Clara L. Taylor
The Hobart Manufacturing Company
711 Pennsylvania Avenue
Troy, Ohio 45373

*** N - - 00.3 00.4 - - - - - ***

DESCRIPTION - The program converts TPLAB and DLAB/XTENT control cards to TLBL and DLBL/EXTENT job control cards. All other cards input to the program are reproduced 80/80. File Hold dates may be assigned by supplying a table of file ID's (hold dates). If no table is supplied, or no match on file - ID can be made, the hold period is not assigned, thereby causing DOS to take the respective default hold periods.

There is an option on the 1052 with a reply as to whether you print an 80/80 listing or print and punch. All job control with the exception of VOL, IPLAB, DLAB, DLAB continuation, and XTENT job control are reproduced 80/80. The exceptions are converted into the new TLBL, DLBL, and EXTENT job control. Calculations for the EXTENT card are made from the starting and ending addresses to arrive at the number of tracks for the new EXTENT card. Program

CONTINUED FROM PRIOR PAGE

has been thoroughly tested at this installation. The program has been used to convert job control as described above for production basis.

PROGRAMMING SYSTEMS - Programming language - DOS ALP. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 16K core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360D0000014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-00.0.015
S/360 ASSEMBLER/COMPILER LIBRARY MAINTENANCE

AUTHORS: M. H. Rosen L. R. Loback

DIRECT TECHNICAL INQUIRIES TO:
M. H. Rosen
IBM Corporation
P.O. Box 390 Dept. H-13, Bldg.850
Poughkeepsie, New York 12601

*** N - - 03.1 03.2 03.5 - - - - ***

DESCRIPTION - This S/360, DOS, Assembler Language program is useful for situations in which programs must be written, then supplied or released to several users. It creates and maintains a library of current DOS Assembler and/or Compiler (FORTRAN, RPG, COBOL, PL/I) output listings in IBM 2311 or 2314 DASD, using a compression technique which saves about 55 percent character space for Assembler listings, and more for compiler listings storage. Included capabilities are - Initial library creation, additions, deletions, replacements, list (one, group, or all) and condense.

PROGRAMMING SYSTEMS - Written in DOS Assembler Language and operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS (1) One (2311 or 2314) DASD extend for the Library. (2) An input device (tape or 2311 or 2314) previously used as SYSLST during assemblies or compilations. (3) SYSIPT, SYSLST, and SYSLOG. (4) DOS support for DAM (direct-access method). (5) DOS support for STXIT-PC (Set Program-check Exit). (6) 16K minimum storage for LMAINT, exclusive of DOS supervisor. (24K is sufficient to handle a Directory of over 500 entries).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D0000015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.016
SYSTEM/360 MULTIPLE LIST PROGRAM

AUTHOR: Mr. W. Batten

DIRECT TECHNICAL INQUIRIES TO:
Mr. W. Batten
IBM Corporation
425 Park Avenue
New York, New York

*** N - - - - - - - - - ***

DESCRIPTION - This program permits multiple 80/80 listing of a card deck which is read into the computer only once. The first listing is produced concurrently as the card deck is being read in. Subsequent listings are obtained simply by pressing the Interrupt Key after the system enters the wait state. It no longer becomes necessary to reload the card deck each time, thus card-handling, card-read-time, and reader-ready-time are eliminated for extra lists. The program consists of four cards. The card images are stacked into core, so 32K will accommodate a card deck of about 400 cards, 64K - 800 cards, etc.

PROGRAMMING SYSTEMS - The program is written in machine

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language.

MINIMUM SYSTEM REQUIREMENTS - Any model 360 with 2540 Card Reader, 1403 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D0000016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.017
SPOOL, A PACKAGE TO CONVERT CURRENT OR FUTURE PRINTED REPORTS TO MAGNETIC TAPE FOR FOREGROUND OR BACKGROUND PRINTING LATER

AUTHOR: B. H. Dilley P. J. Jackson

DIRECT TECHNICAL INQUIRIES TO:
B. H. Dilley
The Hobart Manufacturing Co.
711 Pennsylvania Avenue
Troy, Ohio 45373

*** N - - 03.7 07.0 08.0 - - - - ***

DESCRIPTION - Provide an efficient means to convert current and/or future reports from on line printing to magnetic tape output. Included are macros and techniques to convert Assembler language programs and instructions on what must be done to convert RPG Programs and a Utility "Spool" to print the "Spooled" reports. The "Spooled" reports may be directed to a peripheral or slave computer and/or listed in the background or foreground partition of same computer.

Limitations: Modifications to the ALC programs will increase current program size between 2.6K and 4.0K bytes. RPG program size would increase approximately 500 to 3000 bytes dependent upon options and block-sizes chosen. The "Spool" utility requires 12K problem program area. Block sizes of up to 3400 bytes are allowable. Program may be decreased to 9K by removal of 2nd IO areas and to 6-7K by cutting maximum block size allowable. Type of Routines: Macro and Utility. The "Spool" program requires no assembly unless user wants to modify size, device, etc. The macros require cataloging to Source Statement Library.

Other: This package was designed to ease the way into a multi-programming environment and would provide the greatest use to a user contemplating and/or existing in some. It is usable in a nonmulti-programming environment. Package could be used to speed the conversion of report printing from a large 360 to a slave 360, etc. The "Spool" program contains restart and forms alignment options.

PROGRAMMING SYSTEMS - DOS ALC and Macro Language. RPG how to do it instructions are included. User need not modify RPG or supervisor. The programs are currently running on DOS V3 L18. A version supporting Multi-Programming is required if user implements in a multi-programming environment.

MINIMUM SYSTEM REQUIREMENTS - 360-30, DOS, 32K or greater, Decimal Instruction Set, 2540 Card Reader, 1052 Typewriter, 1403 Printer, 1 or more magnetic tapes (user may convert to disk fairly simply).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D0000017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.0.020
2495 UTILITY PROGRAM FOR OS/360

AUTHORS: A. Cocchi J. M. Dively, Jr.

DIRECT TECHNICAL INQUIRIES TO:
J. M. Dively, Jr.
IBM - Programming Systems Mktg. Development
2651 Strang Boulevard (Triangle)
Yorktown Heights, New York 10598

*** N - - 03.4 07.0 - - - - - ***

DESCRIPTION - A utility program running under OS/360 which will allow input data prepared by the IBM 50 Magnetic Data

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Inscriber or the IBM Magnetic Tape "Selectric" Typewriter to be read from the IBM 2495 Tape Cartridge Reader and output to a BSAM supported device. IBM has announced its intention to provide Type I OS support for the 2495 TCR. The announcement of the Type I program indicated it will only support the sequential access method and will not provide the additional editing facilities contained in IBGENER. Use of this Type III program for other than sequential output or dependencies upon IBGENER options or exits, could require continued use of this Type III program after the Type I program becomes available. Users should avoid use of the features which are exclusive to the Type III program in any application development where conversion to the Type I program is planned.

PROGRAMMING SYSTEMS - The program is an extension to the OS Utility IEBGENER and will run under PCP, MFT and MVT. The program is written in OS Assembler language.

MINIMUM SYSTEM REQUIREMENTS - 6K of core plus buffers plus core requirements for IEBGENER (12 to 14K).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.0.022 *N
PUFER - PUNCH FEED READ UTILITY CARD TO TAPE

AUTHOR: J. Bennett

DIRECT TECHNCIAL INQUIRIES TC:
J. Bennett
220 Burnett Street
Athens, Georgia 30601

*** N - - 06.0 - - - - - - ***

DESCRIPTION - This program was written to provide a multiprogramming installation a method of building foreground job streams without taking the card reader away from the background partition. This program is designed to load cards to tape using the Punch Feed Read feature of an IBM 2540 Card Read-Punch. The program does not recognize a /* or /& card as an end-of-file and can therefore be used to load job streams to tape. The program goes to end-of-job when it read %% in columns 1 and 2 of a card. The percent-percent (%%) card is not loaded to tape. The tape is 1x80 (card image) and ready to become SYSIN for a partition.

PROGRAMMING SYSTEMS - Written in (self-relocating) Assembler using DOS release 18 on a S/360 Model 30.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.0.023 *N
LISTUTIL

AUTHOR: D.R. Clarson

DIRECT TECHNICAL INQUIRIES TO:
D.R. Clarson
HQ USEUCOM J-3
APO New York 09128

*** N - 001A - - - - - - - ***

DESCRIPTION - LISTUTIL is a utility program for sequential or indexed sequential data sets. The program utilizes Queued Access Methods of OS/360 for all input and output operations and will accept and output any record format, as specified on the DD statements or data set labels. A user exit is provided which allows records to be modified,

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accepted or deleted, so that LISTUTIL may be used as an input-output module for user programs. Several internal record processing functions may be selected: Printing each record in a multi-line format with hexadecimal or any printable graphics scan for BCD or user specified character set; translate non-graphics to blank or other specified character sets; specification of number of records processed and starting point, or key class for Indexed Sequential Access Method.

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Operates under OS/360 and requires 10K (plus I/O buffers).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D000023

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-00.1.001 *N
MULTI INPUT TIME SHARING SYSTEM (MITS)

AUTHOR: M. W. Ricciardelli

DIRECT TECHNICAL INQUIRIES TO:
M. W. Ricciardelli
Bell Aerosystems Co.
P. O. Box One
Buffalo, N. Y. 14240

*** S BL MITS 11.0 12.0 - - - - - ***

DESCRIPTION - The multi-utility package is designed to support the input/output needs of a 7090/94 with respect to,

(1) Tape to Print (T to P).
(2) Tape to Card (T to C).
(3) Card to Card (C to C).
(4) Card to Print (C to P).
(5) Card to Tape (C to T).

The above options 1, 2, and 5 are re-enterable so as to facilitate multiple printers and card read/punch devices. The program will do any three functions simultaneously and keep the unit record equipment moving at full speed. Distribution tape contains 3 files in 9 track mode.
1. 2335 records of source cards. 80 byte records.
2. 3221 records of listing. 132 byte records.
3. 133 records of object deck. 80 byte records.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-00.1.002
S/360 PERIPHERAL PROGRAM

AUTHOR: Alice K. Deramus

DIRECT TECHNICAL INQUIRIES TO:
Alice K. Deramus
IBM Corporation
2045 Peachtree Road, N.E.
Atlanta, Ga. 30309

*** N - - 00.3 06.0 - - - - - ***

DESCRIPTION - This program will perform simultaneously card-to-tape, tape-to-punch, and tape-to-print on a 32K Model 30 with four 1403-3 Printers, five 2400 Tape Drives and one 2540 Card-Read Punch, maintaining near maximum speed on all units. The program is written so that I/O devices may be added or removed with very little programming change. In addition to the primary functions mentioned, tapes may be ended and restarted at specified locations, statistical information is produced, and control cards or information entered through the 1052 determine the

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method of processing.

PROGRAMMING SYSTEMS - Written in 360 ALP and operates under the EPS supervisor. Patches have been made so that when one device goes out of ready other operating devices may continue.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.1.003
CLIP/360 CHANGE OR CREATE LABEL IDENTIFICATION PROGRAM FOR DISK AND TAPE

AUTHORS: M. J. Franco J. B. Blomquist

DIRECT TECHNICAL INQUIRIES TO:
M. J. Franco
IBM Corporation
360/Prog. Ctr.
Bldg. 985
Poughkeepsie, N. Y. 12602

*** N - - 01.4 00.3 00.4 - - - - ***

DESCRIPTION - A stand-alone, self-loading card program capable of doing single or multiple jobs including any one or all of the following functions -

1-Change the volume serial number of a previously initialized 1316 Disk Pack.
2-Change the name identification of a previously initialized 1316 Disk Pack.
3-Change the security of a previously initialized 1316 Disk Pack.
4-Create a volume label on tape(s) mounted on IBM series 2400 Tape Drive(s).

CLIP eliminates the rerunning of a DASDI (Direct Access Storage Device Initialization) program to change the volume identification of a disk pack. The use of CLIP can save as much as five (5) minutes of machine time needed to run the complete DASDI program. CLIP will only change the volume identification record (cylinder 0, track 0, record 3) of a disk pack. Valid data on the disk pack is not destroyed, as it would be, if the DASDI program were used. Additional convenience is afforded in the programs ability to create volume labels on tape. Input (device and label identification information) to CLIP is accepted via punched cards, or via the console typewriter.

PROGRAMMING SYSTEMS - Written in System/360 Assembler Language operated on System/360 Models 30, 40, 50 and 65.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30, 16K bytes of core storage, 1 card reader (2540 or 1442), 1 console typewriter, 1-2311 Disk Drive, 1 tape drive (2400 Series Model 1, 2 or 3).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source decks.

ORDERING INFORMATION: PROGRAM NUMBER 360D001003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none

360D-00.1.004 *M
CPO - OS/360 MFT CONCURRENT PERIPHERAL OPERATIONS

AUTHOR: W. C. Goodlett

DIRECT TECHNICAL INQUIRIES TO:
A. Cocchi
IBM Corporation
2651 Strang Blvd.
Yorktown Heights, N. Y. 10598

*** N - - 00.3 00.4 06.0 - - - - ***

DESCRIPTION - The CPO program provides for concurrent

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execution of up to 36 peripheral utility functions within a single, continuously running partition of an OS/360 MFT system. Asynchronous initiation of utility functions is under console-operator control. Blocking and deblocking of records between unit record and magnetic tape or DASD units is supported. Use of command chaining in scheduling I/O devices allows maximum thruput with a minimum impact on other partitions. Facilities for incorporating user modifications are provided.

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language; operates under OS/360 MFT.

MINIMUM SYSTEM REQUIREMENTS - CPO can be run under any OS/360 MFT configuration with I/O devices available for assignment to the CPO functions. A 20k partition is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC		DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	01
OPTIONAL	none	none		none

360D-00.1.005
DOS TAPE, DISK, DATA CELL DUMP

AUTHOR: C. W. Kastner

DIRECT TECHNICAL INQUIRIES TO:
C. W. Kastner
IBM Corporation
1011 San Jacinto
Austin, Texas 78701

*** N - - 04.1 00.3 00.4 00.5 - - - ***

DESCRIPTION - This is a generalized dump utility in that it will dump any tape (7 or 9 track, labeled or unlabeled, etc.) and will dump any 2311 or 2321 track (i.e., VOL number, VTOC, alternate track, etc.) For all files, the user can print in either vertical HEX and EBDIC, Horizontal HEX and EBDIC, HEX only, or EBDIC only, and can print the first N lines of each logical tape record or each DASD block. For tape files, the user can control rewinding, deblock records, print multiple files, skip down N tape blocks before beginning dumping, print the first N records of a file, then skip to next EOF mark, backspace and dump the last 5 tape blocks, forward space or backspace tape by console contrcl, and has the option of printing report tapes under single space or first character carriage control.

PROGRAMMING SYSTEMS - Written in Assembly Language and operates under 16K DOS.

MINIMUM SYSTEM REQUIREMENTS - 32K S/360 with DOS configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D001005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-00.1.006
DOS/TOS DEBE UTILITY PROGRAM

AUTHOR: D Hankerson

DIRECT TECHNICAL INQUIRIES TO:
D. Hankerson
IBM Corporation
3424 N. Central
Phoenix, Ariz. 85012

*** N - - 00.3 00.4 06.0 - - - - ***

DESCRIPTION - DOS/TOS - DEBE Utility Program is an adaptation of "DEBE Utility Programs" to the Disk and Tape Operating Systems. DOS/TOS - DEBE Utility Program performs the following functions in conjunction with the Disk or Tape Operating System - Card to card, card to printer, card to tape, tape to card (80 character, fixed length,

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blocked or unblocked records), tape to print (BCD or Hexidecimal), tape to tape, and four tape control functions. Selection of the desired utility function is accomplished from the 1050 Console Typewriter or from option control cards in the input job stream. The programs are interruptable and an external interrupt causes the program to request the next program ID.

MINIMUM SYSTEM REQUIREMENTS - Those necessary to run DOS/TOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.1.007
IBM S/360 MULTIPLE REPRODUCE PROGRAM

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corporation
Data Center
570 Broad Street
Newark, N. Y. 07102

*** N - - - - - - - - - ***

DESCRIPTION - This program permits reproducing as many copies as desired of a master deck which is read into the computer only once. The first reproduced deck is punched concurrently as the master deck is being read in. Subsequent decks are obtained simply by pressing the Interrupt Key after the system enters the wait state. The card images are stacked into core, sc 32K will accommodate a master deck of about 400 cards, 64K - 800 cards, etc.

PROGRAMMING SYSTEMS - Written in machine language.

MINIMUM SYSTEM REQUIREMENTS - Any model S/360 with a 2540 Card Read/Punch on line.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.1.009
DEBE - UTILITIES PROGRAM

AUTHOR: Mr. L. G. DeFrance

DIRECT TECHNICAL INQUIRIES TO:
Mr. L. G. DeFrance
IBM Corporation
100 S. Wacker Drive
Chicago, Illinois 60606

*** N - - 00.3 06.0 08.4 08.5 - - - ***

DESCRIPTION - The System/360 DEBE Utilities is a collection of card, tape, and printer utilities.

PROGRAMMING SYSTEMS - Written as a single module in IBM BPS Assembler Language (8K tape). Up to 10,000 byte record lengths are accepted by the tape utilities excepting the card to tape and tape to card which are limited to 80 byte records. Tape to tape, tape to printer, (Hexidecimal or BCD), card to card, card to printer, write tapemark, and four tape positioning routines are the remaining functions.

MINIMUM SYSTEM REQUIREMENTS - 16K storage, Decimal Arithmetic, and 2540 Card Reader Punch, 2400 Tape Drives, 1403 Printer as required for assembly or the selected DEBE function. The 1050 Console Typewriter is required for selecting the DEBE function, assigning tape drive addresses, and selecting the mode for 7 track tape drive operations.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE

CONTINUED FROM PRIOR COLUMN

DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D001009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-00.1.011
DOSDEBE - A SYSTEM/360 MULTIPLE UTILITY PROGRAM FOR USE WITH TOS/DOS

AUTHOR: D. V. Thomas

DIRECT TECHNICAL INQUIRIES TO:
D. V. Thomas
IBM Corporation
373 Broadway Ave.
Winnipeg 1, Manitoba, Canada

*** N - - - - - - - - - ***

DESCRIPTION - The System/360 DOSDEBE program is a collection of card, tape and printer utilities. The structure of this program allows it to be executed as either a background or foreground program in a multiprogramming environment. The functions provided are - Card to card, card to tape, card to printer, tape dumps in Hexadecimal and/or EBCDIC, tape to card, write tape mark and four tape positioning routines. A routine to print and punch the contents of a tape previously assigned as SYSLST or SYSPCH is also included.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires DOS/TOS.

MINIMUM SYSTEM REQUIREMENTS - Are the same as the requirements for TOS/DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAI PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.1.013
DEBE-DOS UTILITY PROGRAM

AUTHOR: A. H. Raedeke

DIRECT TECHNICAL INQUIRIES TO:
A. H. Raedeke
IBM Corporation
7321 W. Lake St.
River Forest, Ill. 60305

*** N - - 04.1 04.3 - - - - - ***

DESCRIPTION - The System/360 DEBE-DOS utility is an adaptation of the original BPS DEBE utility. In addition to the original card, tape, and printer functions, DEBE-DOS also provides 2311 Disk to printer and 2311 VTOC display functions, in non-DASD file protect systems. The program is loadable from the core image library of DOS.

PROGRAMMING SYSTEMS - Requires DOS.

MINIMUM SYSTEM REQUIREMENTS - The 1050 Console for function selection and symbolic unit assignments.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D001013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-00.1.014
AUTODOC-V - AN AUTOMATIC DOCUMENTATION AND SYMBOLIC FLOW CHARTING PROGRAM FOR THE IBM S/360

CONTINUED FROM PRIOR PAGE

AUTHOR: F. D. Lewis

DIRECT TECHNICAL INQUIRIES TO:
F. D. Lewis
IBM Corporation
Neighborhood Road
Kingston, N.Y. 12401

*** N - - 03.1 - - - - - - ***

DESCRIPTION - This program is an expanded version of Type III program 360D-00.2.003. The flowcharts are now on a 10 by 5 matrix instead of 10 by 4. The output format has been changed. Additional line generation routines are also available.

PROGRAMMING SYSTEMS - Written in Assembler Language; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - A 64K capable of executing OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source decks.

ORDERING INFORMATION: PROGRAM NUMBER 360D001014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none

360D-00.1.017
DOS ON-LINE JOB LOGGING PROGRAM

AUTHOR: C. J. Bourdages

DIRECT TECHNICAL INQUIRIES TO:
C. J. Bourdages
IBM Corporation
PACOP 560
Comptroller HQ USARJ
APO San Francisco, Calif. 96343

*** N - - - - - - - - - ***

DESCRIPTION - This series of programs was developed to provide job accounting information to users of DOS. The key program in the series performs a job logging function when it is appended to Job Control. Data is collected from the // JOB card, the communication region, Interval Timer and various supervisor tables. Pertinent data includes user job identification, user accounting codes, start time, stop time, job duration, data and job termination codes. A separate record is created for each job and stored on a disk file as an 80 character record.

The second and third programs in the series handle disk initializing and disk to card unloading. The cards are meant to be used in further job accounting and management analysis programs but specific processing details are left to individual users.

The Job Logging Program has facilities for accepting usage meter data from the console keyboard. A technique for pro-rating elapsed meter time is presented in the appendix. This technique is being used to distribute chargeable meter time at the installation where these programs were developed.

PROGRAMMING SYSTEMS - These programs are written in DOS Assembly Language and use PIOCS for all input/output.

MINIMUM SYSTEM REQUIREMENTS - A 2030 with 32K, Decimal Instruction Set, Interval Timer, one channel, 1052 Printer Keyboard and either a 2311 or 2314. In addition, some device must be available for assignment to the SYSPCH function.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.1.018
DOS INTERFILE TRANSFER AND MANIPULATOR FOR AID IN TESTING AND OPERATIONS

AUTHOR: C. Alexander

DIRECT TECHNICAL INQUIRIES TO:
C. Alexander
IBM Corporation
22720 W. Michigan Ave.
Dearborn, Mich. 48124

*** N - - 04.0 06.6 07.0 08.0 - - - ***

DESCRIPTION - DOS Interfile Transfer and Manipulator Program for Aid in Testing and Operations (DITTO), is a generalized program which operates in a DOS environment. Thirty-three (33) functions are available to support unit record, tape and 2314 Disk. Functions available in addition to normal tape, disk and card functions are: Tape and disk record scan, disk and tape record alteration, disk ID volume number change, initialize tape, deblocking of tape and disk records when printing, and user tape error handling.

FEATURES - (1) The program is self-relocating to allow operating in any partition. Tape and disk record size is limited only by the amount of core available at execution time. (2) Operations may be performed entirely from the console or function card statements may be job-streamed for remote programmer use. (3) All console communication is in terms of physical hardware I/O addresses, eliminating the need for knowledge of current logical assignments. Tape density and mode settings may be entered via the console. (4) DITTO functions in a DASD file protected environment without volume label statements. Printed output reflects the physical and logical addresses and file characteristics (density, etc.) of the input file.

PROGRAMMING SYSTEMS - Written in Assembler Language and utilizes DOS/360.

MINIMUM SYSTEM REQUIREMENTS - System/360 DOS System with a 1403 Printer and a minimum 14K problem program area.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.1.020
RECREATE AND LIST OS/360 CATALOG

AUTHOR: K. W. Christiansen

DIRECT TECHNICAL INQUIRIES TO:
K. W. Christiansen
IBM Corporation
515 Olive Street
St. Louis, Missouri 63101

*** N - - - - - - - - - ***

DESCRIPTION - This program is used to list and/or punch the entries in the SYSCTLG data set(s) under OS/360. This listing shows all indexes, cataloged data sets, control volume pointers, and aliases in the catalog, and gives some statistical information about the catalog. The punching function of the program creates the necessary input control cards for IEHPROGM to recreate the catalog. The two functions of the program provide back-up and ease of maintenance of the catalog.

PROGRAMMING SYSTEMS - The program is written in Assembler Language to run under the Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - Requires approximately 6K of core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.1.021
S/360 GENERALIZED EXTRACTION AND MATCH PROGRAM

AUTHOR: W. Buffa

DIRECT TECHNICAL INQUIRIES TO:
W. Buffa
112 E. Post Road
White Plains, New York 10601

*** N - - 003 043 121 990 - - - ***

DESCRIPTION - This program is a self-modifying utility. It will extract or delete records from a file based on the results of table searching and/or range testing as requested by the user through the use of control cards. The primary output may be the same as the input or it may be reformatted, and additional constant data may be inserted into it. A secondary output file may be specified for those records not meeting the primary output file requirements. If a second input file is specified, routines are activated which will cause matching of primary versus secondary input records on user-specified control fields. Various options are then available under the various match results. The user may also specify up to three control totals to be taken from each file, control blocking factors, specify processing limitations and random selection of data, and request nines padding if desired. The program occupies 53,100 bytes of core, excluding I/O areas which are allocated at object time.

PROGRAMMING SYSTEMS - Written in PL/I; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 50 or 65.

BASIC PROGRAM PACKAGE
DOCUMENATATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.1.022
NYU PRINT-UTILITY PROGRAM

AUTHOR: R. A. Weingarten R. H. Greenfield

DIRECT TECHNICAL INQUIRIES TO:
R. A. Weingarten
New York University
Heights Academic Computer Ctr.
university Heights, New York, N.Y. 10453

*** S NYH - 06.5 12.1 - - - - - ***

DESCRIPTION - The NYU Print-Utility Program was developed tc provide a user with a fast and efficient method (under OS) of obtaining multiple copies and/or multiple punched decks of their data. It contains some means of editing the form of the output. It can make multiple copies of any section of the input data, multiple punched decks of any part of the data (or both copies and punched decks- each task is independent of the other), place a user identification in column 73-76 of the punched output, number the deck of punched output (col. 77-80) and provide a line number for the listing, provide the starting point and increment value for the numbering, translate from or into BCD, EBCDIC, or code for CDC 6600 (FORTRAN only) from any code, place one or two blank lines between each line of the listing, number pages (can specify starting page number), specify the number of printer lines per page, restart a page of the listing, place a title on each page of printed lines per page, restart a page of the listing, place a title on each page of the listing (a different title on each page if desired), and a few other editing tasks.

PROGRAMMING SYSTEMS - Written in OS/360 Basic Assembly Language. It has been tested in a PCP and MFT-II environment and uses a 14K partition on MFT-II.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D001022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none

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OPTIONAL	none	none	none

360D-00.2.001
BPS/DOS/TOS FORTRAN FLOWCHART PROGRAM

AUTHOR: G. E. Gautney, Jr.

DIRECT TECHNICAL INQUIRIES TO:
G. E. Gautney, Jr.
Corning Glass Works
Scientific Computer Services
Corning, N.Y. 14830

*** S CGW FLOWZ 02.0 04.0 - - - - - ***

DESCRIPTION - The BPS/DOS/TOS FORTRAN Flowchart Program is intended primarily as a debugging documentation aid. It accepts as input BPS, DOS or TOS FORTRAN source programs and prepares automatically a block diagram flow chart of the input program.

PROGRAMMING SYSTEMS - Program source language is BPS FORTRAN but can also be used as a DOS/TOS FORTRAN program since no statements unique to either version of 360 FORTRAN are used.

MINIMUM SYSTEM REQUIREMENTS - Those needed for BPS/DOS/TOS FORTRAN are adequate.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D002001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.2.002 *M
SYSTEMS FLOW CHARTER FOR DOS

AUTHOR: D. L. Fisher

DIRECT TECHNICAL INQUIRIES TO:
D. L. Fisher
IBM Corporation
Bldg. 051
Monterey & Cottle Roads
San Jose, Calif. 95114

*** N - - 06.8 06.6 - - - - - ***

DESCRIPTION - The program is a S/360 - DOS systems flow charter. The program will draw systems flow charts, create a "systems table and program-file cross-reference". The symbols drawn are tape, random file, card, document, graphic display, terminal, keyboard, paper tape, comments, clerical operation, adding machine transmittal tape, multiple (2 or 3) card symbol, off page connector, off line storage and sequence of file. The program will use the same transaction format as the "Systems Flowcharts for the IBM 1401" PID number 1401-02.0.039

PROGRAMMING SYSTEM - Written in Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - 32K or more of core, 1 - 2311 Disk File, 1443 or 1403 Printer, 1442 or 2540 Card Reader.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D002002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-00.2.003
AUTOMATIC DOCUMENTATION AND FLOWCHARTING PROGRAM

AUTHORS: F. D. Lewis M. F. Stewart
R. O. Drake J. F. Sander

DIRECT TECHNICAL INQUIRIES TO:
F. D. Lewis
IBM Corporation
Neighborhood Road
Kingston, N.Y.

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*** N - - 06.8 06.6 - - - - - ***

DESCRIPTION - A program which produces text and flowcharts from card input. The flowchart language is a symbolic language, when a connection is desired from one symbol to another the symbol going to is referred to by a symbolic name and the program generates a line, if possible, or a connector with the proper coordinate and page number inserted. The user has the option of selecting his own character set for the printing of symbols, lines and arrowheads. The syntax of the language is compatible with a 1401 version of the program available from PID under catalog number 1401-02.0.024.

PROGRAMMING SYSTEMS - Written in source language and operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - 64K storage and tapes or disk.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D002003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

360D-00.2.004
S/360 DOS-TOS JOB CONTROL FLOWCHART PROGRAM

AUTHOR: E. P. Mc Dowell

DIRECT TECHNICAL INQUIRIES TO:
E. P. McDowell
IBM Corporation
973 James Street
Syracuse, New York

*** N - - - - - - - - - ***

DESCRIPTION - S/360 DOS-TOS Job Control Flowchart Program flowcharts individual runs using DVCGEN cards from system generation deck and either DOS or TOS job control cards as input. The program format is a run-flowchart showing a process block and all input/output devices of a computer run. The program will flowchart 12 (maximum) for output. (Excluding disk and including each tape drive as a device). The program has the capacity to handle a maximum of 6 files assigned to any one unit-record device and a maximum of 24 files assigned to a tape or any one direct access type.

USE - The program is useful for computer operations documentation (run books) and system conversions.

PROGRAMMING SYSTEMS - Source language is S/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The program requires a 32K system with a 2540 Card Reader and a 1403 Printer, plus equipment to support either DOS or TOS systems.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D002004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-00.2.005 *M
O/S FLOWCHARTS

AUTHOR: S. W. Harrold

DIRECT TECHNICAL INQUIRIES TO:
S. W. Harrold
Sun Life Assurance Company of Canada
P. O. Box 6075
Montreal 101, Quebec

*** N - DAF - - - - - - - ***

DESCRIPTION - This system is designed to draw program flowcharts and is intended to minimize the planning and effort required to produce and maintain program documentation. It is executed under control of the full Operating System.

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It enables the user to:
1. Produce clear, standardized, easily reproduced computer-generated flowcharts.
2. Keep flowcharts continually up to date.
3. Standardize flowcharting techniques.

This program is an O/S version of System/360 Flowchart and as such the write-up accompanying it must be used in conjunction with the IBM publication System/360 Flowchart User's Manual H20-0293.

PROGRAMMING SYSTEMS - Written in Assembler F using various access methods.

MINIMUM SYSTEM REQUIREMENTS - Any Model S/360 with a minimum of 64K bytes of memory available to the problem program can be used. This implies a physical minimum of 128K. Both the Standard and Decimal Instruction Sets are used although the latter can be eliminated by reprogramming a single small subroutine. Five utility data sets are required, two of which must reside on direct access volumes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D002005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-00.2.006 *M
OS SYSTEM/360 FLOWCHART (OSFLOW): DOS FLOWCHART UNDER OS

AUTHOR: R. R. Newson

DIRECT TECHNICAL INQUIRIES TO:
R. R. Newson
IBM Corporation
2930 West Imperial Highway
Inglewood, California 90303

*** N - - - - - - - - - ***

DESCRIPTION - This documentation aid operates under control of System/360 Operating System (OS). It is a modification to the System/360 Flowchart program 360A-SE-22X, an IBM Type II program written to run under the System/360 Disk Operating System (DOS). The program gives OS users the same flowcharting capability formerly available only in Operating System (DOS). The program gives OS users the same flowcharting capability formerly available only in the DOS environment. It enables the user to: (1) Produce clear, standarized, easily reproduced flowcharts. (2) Standardize flowcharting techniques.

PROGRAMMING SYSTEMS - Source language is Assembler; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40 (128K).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D002006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-00.3.001 *M
MODIFICATION OF S/360 BPS MULTIPLE UTILITY FOR OFF-LINE SUPPORT TO OS/360

AUTHORS: W. M. Jackson J. P. Springer

DIRECT TECHNICAL INQUIRIES TO:
W. M. Jackson
IBM Corporation NASA Program
1120 Connecticut Ave. N.W.
Washington, D.C. 20036

*** N - - 00.1 06.0 - - - - - ***

DESCRIPTION - This program modification to the S/360 BPS Multiple Utility (8K), 360P-UT-055, allows simultaneous card-to-tape, tape-to-printer, and/or tape-to-card operations to support OS/360 format requirements in a stacked-job environment. A printer with the Universal Character Set feature may be used. This Assembly Language

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program is used on a peripheral computer in preparing input stream tapes for the main computer and performing the printing and punching from the OS/360 output writer tapes. The modified program, permanently residing in core, is started and restarted as required through console typewriter entries. It handles the variable-length, multi-data-set output tapes, skipping tape marks and labels, deblocking ABEND records, and disregarding invalid characters. Operator entries and typewriter messages are minimized for ease of operation and speed.

PROGRAMMING SYSTEMS - Written in Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Those required for BPS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-00.3.002
MASTER CREATION PROGRAM

AUTHORS: Mrs. J. Carter S. Nahmias
G. Neel

DIRECT TECHNICAL INQUIRIES TO:
Mrs. J. Carter
IBM Corporation
40 Saw Mill River Road
Hawthorne, New York 10532

*** N - - 13.1 01.6 12.1 - - - - ***

DESCRIPTION - This BPS program creates a "master" tape containing identification and tape statistics for submission to and use by the Program Information Department. It is a tape copier which terminates input on any of several options, and keeps statistics as to record, tape mark and character counts, and maximum record size. Upon completion of the copy, it generates a special trailer containing these counts plus any specified identification of up to 15 non-blank characters. This increases tape security by making the identification and statistics a permanent part of the contents in the trailer required by PID. This information is verified in copies made for distribution. The program also recognizes the trailer thus generated as a terminator.

MINIMUM SYSTEM REQUIREMENTS - Model 30, 16K, 1 Selector Channel, 1052 Console Typewriter, Card Reader and 1403 Printer, and two 2400 Tape Units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-00.3.003
DOS/TOS INITIALIZE TAPE PROGRAM

AUTHOR: D. Hankerson

DIRECT TECHNICAL INQUIRIES TO:
D. Hankerson
IBM Corporation
3424 N. Central
Phoenix, Ariz. 85012

*** N - - 04.3 01.1 03.4 - - - - ***

DESCRIPTION - Its purpose is to initialize tapes with standard S/360 volume and header labels. One volume and header label is written for each control card. The program cycles through the available tape drives initializing tapes, until all the control cards have been read. The advantage of having an initialize tape program that runs under DOS/TOS is that tapes can be initialized as part of the job step. This is particularly useful when testing new S/360 application programs.

PROGRAMMING SYSTEMS - DOS/TOS - Initialize Tape Program operates in conjunction with the Disk Operating System

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or the Tape Operating System.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/TOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.004
TAPE FILE CREATION PROGRAM

AUTHOR: R. Vonwasmuth

DIRECT TECHNICAL INQUIRIES TO:
R. Vonwasmuth
IBM Corporation
3424 Wilshire Blvd.
Los Angeles, Calif. 90005

*** N - - 01.6 07.1 06.0 - - - - ***

DESCRIPTION - This program produces S/360 tape files with blocked or unblocked variable or fixed length records from card input. The BPS Utility and the Autotest Card-to-Tape programs are very limited when output records are other than fixed length or have varying formats. This program will write packed, unpacked or binary data on the tape according to field control characters punched in data cards. There is no need for the user to determine the block count and/or record count for variable length records, as in Autotest, nor are the blocks limited to 400 characters. Ease of use and flexibility of output are the main criteria for using this program in preference to the current utilities mentioned.

PROGRAMMING SYSTEMS - Written in S/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The program requires less than 16K of core (including supervisor and job control) and one 2400 Series Tape Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.006
DOS/360 LINE-IMAGE TAPE TO PRINTER WITH RESTART

AUTHOR: R. Mackinnon

DIRECT TECHNICAL INQUIRIES TO:
R. Mackinnon
IBM Corporation
112 East Post Road
White Plains, New York 10601

*** N - CVUT - - - - - - - ***

DESCRIPTION - This program prints line-images from magnetic tape under control of DOS/360. Tape records are 133 bytes long and carry a 1401 D-Modifier for forms control (Option b). Program specifications are designed to facilitate processing of print tapes built by the CPI System (1401-01.4.228). Consequently, tape records less than 133 bytes are treated as console messages and are printed on the 1052. During program loading, restart facility permits forward or backward spacing of the print tape in increments of complete pages on the tape. Also, a page can be printed during restart to guide decisions on positioning of the print tape.

PROGRAMMING SYSTEMS - The program is self-relocating and is written in Assembly Language using the DOS/360 Utility Macros. Backward spacing of the print tape during restart requires either a 9-track or 7-track drive (the latter with the Translate feature on) since the tape is read backward.

MINIMUM SYSTEM REQUIREMENTS - DOS system components, 1052 Console Typewriter, 2400 Series Tape Drive and a printer. Minimum partition size is 4K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.

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MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D00303006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.007
DOS SORT USER EXIT ROUTINES TO PROCESS 1401 TAPE LABELS

AUTHOR: G. W. Lawson

DIRECT TECHNICAL INQUIRIES TO:
AUTHOR: G. W. Lawson

DIRECT TECHNICAL INQUIRIES TO:
G. W. Lawson
IBM Corporation
3777 Long Beach Blvd.
Long Beach, Calif. 90807

*** N - - 12.0 06.1 - - - - - ***

DESCRIPTION - DOS Sort user exit routines which read and check and/or generate and write standard 80-character 1401 tape labels.

PROGRAMMING SYSTEMS - The routines are written in DOS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - System/360 disk or tape system. These routines can be of great value to a user who is emulating 1401 programs but wants to take advantage of the greater speeds of the System/360 DOS Sort.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D00303007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.008 *M
CUTOVR - COPY UNDEFINED 7 AND 9 TRACK TAPE RECORDS OR VERIFY RESULTS

AUTHOR: T.V. Pasko

DIRECT TECHNICAL INQUIRIES TO:
T.V. Pasko
IBM Corporation
1120 Connecticut Ave. N.W.
Washington, D.C. 20036

*** N - - 02.0 06.5 - - - - - ***

DESCRIPTION - This program was designed to accomplish four functions concerning 7 and 9 track undefined tape records not exceeding 4K bytes/characters -
- Copy 7 track tape, punching and printing 7 track error records.
- Verify the 7 track copy, excluding error records detected in the copy phase.
- Copy 9 track tape, merging new and/or corrected error records, while punching and printing 9 track error records.
- Verify the 9 track copy, including merged records and excluding error records detected in the copy phase.

Although primarily intended for use at installations undergoing 7 to 9 track tape conversion, its two 9 track phases can be used at installations using 9 track tape exclusively.

PROGRAMMING SYSTEMS - An IBM System/360 Basic Assembler Language program.

MINIMUM SYSTEM REQUIREMENTS - A 16K S/360 with Standard Instruction Set, Decimal Arithmetic.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D00303008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none

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OPTIONAL	none	none		none

360D-00.3.009
SLIP - SOURCE LIBRARY INQUIRY PROGRAM

AUTHOR: W. S. Pensiero

DIRECT TECHNICAL INQUIRIES TO:
W. S. Pensiero
IBM Corporation
Hotel Astor
1515 Broadway
New York City, N.Y.

*** N - - 00.1 06.8 03.0 - - - - ***

DESCRIPTION - The primary function of SLIP is to store on tape, in a blocked format, symbolic cards for 360 programs. Other functions are the ability to list, punch, list and punch, delete, or update symbolic programs. There is also a copy feature for the entire tape. The update feature can be used for an entire symbolic program, the input coming from either tape or card. The update feature can also be used to change individual statements in an existing program that is cataloged on the SLIP tape. The program SLIP Source Library Inquiry Program, interfaces to an assembled 8K BOS supervisor and job control. There is also an operators message program which can be executed to give operating instructions.

MINIMUM SYSTEM REQUIREMENTS - The SLIP program tape will execute on an 8K S/360 Model 30 or larger system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D00303009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.3.010
DOS DISK/TAPE SORT USER EXIT ROUTINE TO PROCESS 1400 STANDARD LABELS

AUTHOR: S. Kawana

DIRECT TECHNICAL INQUIRIES TO:
S. Kawana
IBM Japan
Nihenbash-Honcho 3-5
Chuo-Ku
Tokyo, Japan

*** N - - - - - - - - - ***

DESCRIPTION - This program is written to process 1400 standard tape labels (80-characters) under DOS Disk Sort users exit. It enables the system which uses the 1401/1460 Emulator or processes 1400 labels under DOS to increase the speed of sort. This program reads "label information card" checks header label and generates 80-character labels - header and trailer (generates record counts and block counts). It also supports multivolume file and/or multifiles inputs, but does not allow deblocking.

MINIMUM SYSTEM REQUIREMENTS - 64K but can be modified to any other size and to tape sort.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D00303010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.011
MULTIPLE TEST TAPE GENERATION FOR THE 360/30

AUTHOR: S. Sarreals

DIRECT TECHNICAL INQUIRIES TO:
S. Sarreals
IBM Corporation
N.Y. Publishing
555 Madison Ave.

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New York, N.Y. 10022

*** N - - - - - - - - - - ***

DESCRIPTION - This BPS program generates 1 to 5 labelled tape files from card input. Output records are fixed-length and may be blocked or unblocked. Record length can be a maximum of 350 bytes, block size a maximum of 4000 bytes. Record format may vary from file to file and from logical record to logical record. Individual fields may be packed or zoned.

PROGRAMMING SYSTEMS - The program was written under BPS.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 with 32K and 6 tapes. However, the source deck can easily be modified to reduce or to increase the specified record size, block size, and the number of files generated.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.012
DOS/TOS UPDATE PROGRAM TO MAINTAIN MULTIPLE PROGRAM MODULES ON MAGNETIC TAPE

AUTHOR: G. A. Davison

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
DPD Technical Center
Dept. H04, Bldg. 850
P.O. Box 390
Poughkeepsie, N.Y. 12602

*** N - - 03.0 04.0 06.0 - - - - ***

DESCRIPTION - This program provides the facility to keep many source program modules or other data such as job control procedures on a single tape. Each module on the tape is separated from the others and has its own sequence numbers starting at 000000. The program uses blocked old and new master tapes (40 cards/block) and produces a third deblocked tape to be used by the language translators. A most important feature is that only those modules specified by the user are written on the deblocked tape.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 32K Model 30, 3 tape drives for DOS, 4 tape drives for TOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.3.015
S/360 SCIENTIFIC SUBROUTINE PACKAGE UPDATE UTILITY

AUTHOR: G. Brick

DIRECT TECHNICAL INQUIRIES TO:
G. Brick
IBM Corporation
District 7 Datacenter
1365 Peach Tree St. N.E.
Atlanta, Ga. 30309

*** N - - 13.0 17.0 - - - - - ***

DESCRIPTION - This is a S/360 program which will add, delete, and change records from the Scientific Subroutine Package (360A-CM-03X). The output is a new tape with current corrections (APAR's, etc.) in place -- The PID tape is not altered and should be retained for backup. A description of the change that has been made is listed on the printer for each corrected subroutine -- all of each subroutine which is corrected is printed. A program of this type is necessary if an up-to-date library is to be maintained on tape. A system of card backup would

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require over 36,800 cards.

PROGRAMMING SYSTEMS - Written in S/360 DOS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 or above, a 2311 disk, 2 tape drives, a 2540 Card Reader, a 1403 Printer, and a 1052 console.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.016
TWO 2400 DATA CONVERSION UTILITY PROGRAMS

AUTHOR: V. S. Clowe

DIRECT TECHNICAL INQUIRIES TO:
V. S. Clowe
IBM Corporation
8400 Maryland
Clayton, Mo. 63105

*** N - - - - - - - - - ***

DESCRIPTION - This package consists of two programs that provide software substitution for the Data Convert feature on 2400 tape units. The first program reads a seven track tape, written in the Data Convert mode and produces a nine track tape. Any type input records up to and including 32,000 tape characters can be handled. The second program reads a nine track tape and writes a seven track tape in Data Convert format. That tape could then be read on another 2400 under Data Convert. Any type input records are acceptable with a maximum size of 24,000 bytes.

PROGRAMMING SYSTEMS - Written in S/360 OS Assembler F Language.

MINIMUM SYSTEM REQUIREMENTS - A S/360 F-Level Model 30 or above with two 2400's one with seven track compatibility at 800 bpi.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.017
GENERAL PURPOSE TAPE PRINT MULTIPROGRAMMING UTILITY FOR DOS/COS

AUTHOR: J. W. Gunther

DIRECT TECHNICAL INQUIRIES TO:
J. W. Gunther
IBM Corporation
1031 North Brand Blvd.
Glendale, California 91202

*** N - - - - - - - - - ***

DESCRIPTION - This program is designed to run in a 6K foreground partition of DOS/360. It will print output from COS, COBOL, Sort/Merge and other system utilities. The tape should be created as a series of jobs, each composed of JCL followed by a print-file. When printed, the output then resembles that of an on-line printer. Capabilities include the selective printing of jobs, forms changing and print alignment, and multiple volume switching. Documentation includes a guide to creating the tape, initiating the program, as well as an operator's guide to console messages.

PROGRAMMING SYSTEMS - Programming language - DOS/360 Assembler Language.

MINIMUM SYTEM REQUIREMENTS - One 1403/1443 Printer, one 2400 series Magnetic Tape Drive, one 1052 Console assigned to SYSLOG, and 6K of core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.018
MULTI-TAPE MULTI-FILE COPY/COMPARE PROGRAM

AUTHOR: J. L. Miller

DIRECT TECHNICAL INQUIRIES TO:
J. L. Miller
IBM Corporation
DPD Technical Center
Dept. H09, Bldg. 850
P. O. Box 390
Poughkeepsie, N. Y. 12602

*** N - - - - - - - - - - ***

DESCRIPTION - The Multi-Tape Multi-File Copy/Compare Program will copy and/or compare up to 9,999 files with a maximum record length of 16,000 bytes onto one or more output tapes (maximum of seven). The program runs under DOS and is self-relocating which allows it to be executed in any 36K foreground or background. The program requires SYSNO's SYS010 through SYS017. SYS017 must be assigned to the master and SYS010 through SYS016 are used for the output tapes.

PROGRAMMING SYSTEMS - Operates under DOS/360.

MINIMUM SYSTEMS REQUIREMENTS - Those required for 360/DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.3.019
SSP TAPE SELECT DEBLOCK AND CATALR FOR DOS

AUTHOR: T. Desimio

DIRECT TECHNICAL INQUIRIES TO:
T. Desimio
IBM Corporation
3610 Fourteenth Street
Riverside, California 92502

*** N - - 12.1 - - - - - - ***

DESCRIPTION - SSP Tape Select Deblock and CATALR for DOS will select subroutine specified by card input from the PID format SSP tape and build a job stream tape. The job stream compiles the selected subroutines and catalogs them into the Relocatable Library. This program allows an installation to bypass punching the SSP tape or the object decks.

PROGRAMMING SYSTEMS - Programming language - DOS Assembler Language. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - 2 tape drives and occupies less than 6400 bytes of storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.020
FILE PRINT-A MULTI-LINE PRINT UTILITY PROGRAM WITH INPUT FROM TAPE OR DISK

AUTHOR: R. M. Brinkley

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DIRECT TECHNICAL INQUIRIES TO:
R. M. Brinkley
IBM Corporation
4040 North Fairfax Drive
Arlington, Virginia 22203

*** N - - 00.4 06.8 - - - - - ***

DESCRIPTION - File Print is a program designed to print records from tape or disk (sequential or index-sequential), with user specified flexible format of the printed output. From each input record, one or more lines may be printed by forming each line with any mixture of (1) direct movement, (2) unpacking or (3) coversion to hexidecimal digits. One line of heading information up to 132 characters may be supplied by the user. Page numbering is automatic - this is not a user option. Options for single or double spacing are supplied. If neither option is specified, then single spacing is used for each line of a given input record with double spacing between input records.

PROGRAMMING SYSTEMS - Programming language - Assembly Language. Operating system required - DOS/360.

MINIMUM SYSTEM REQUIREMENTS - The present form of the source program requires a 1403 Printer and a 2540 Card Reader/Punch. It also requires a tape drive (9 track or 7 track) and/or a 2311 Disk Drive and/or a 2314 Disk Drive. The assembled program excluding supervisor but including I/O areas and logic modules, occupies 8K of main storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.021
FILE CREATE - A FILE CREATING UTILITY PROGRAM

AUTHOR: R. M. Brinkley

DIRECT TECHNICAL INQUIRIES TO:
R. M. Brinkley
IBM Corporation
4040 North Fairfax Drive
Arlington, Virginia 22203

*** N - - 00.4 06.0 - - - - - ***

DESCRIPTION - File Create is a program designed to build a tape or disk (sequential or index-sequential) input. One output record can be built from one or more input records and the fields can be converted to any format desired with any mixture of (1) direct field movement, (2) packing, and (3) converting to binary (byte, halfword or fullword). A padded record, as the last output record, is provided if the user desires. With the exception of blank, any character (all 9's, 7's, etc.) may be used.

PROGRAMMING SYSTEMS - Programming language - Assembler Language. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - A 2540 and a 1403 and/or tapes and disks (2311's or 2314's). The assembled program excluding supervisor but including I/O areas and logic modules, occupies approximately 13K of main storage. This may be reduced considerably if the program is to be used only with card input for file creation.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.022
S/360 SCIENTIFIC SUBROUTINE PACKAGE RETRIEVE UTILITY

AUTHOR: G. Brick

DIRECT TECHNICAL INQUIRIES TO:
G. Brick
IBM Corporation
District 7 Datacenter
1365 Peachtree St. N.E.
Atlanta, Georgia 30309

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*** N - - - - - - - - - - ***

DESCRIPTION - This is a S/360 DOS Assembler Language program which will retrieve any selected subroutine(s) from the Scientific Subroutine Package (360A-CM-03X). The requested subroutine(s) is listed on the printer, and also punched into cards. With this program it is not necessary to de-block the program transmittal tape and all files are available for selective retrieval. It is not necessary to specify the number of routines to be selected.

PROGRAMMING SYSTEMS - Written in DOS Assembler Language and utilizes DOS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 (DOS), 1-2311, 1-tape drive, 1-2540 Card Read/Punch, 1-1403 Printer, 1-1052 Console Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.023
SEARCH TAPE UTILITY PROGRAM - S/360 TEST DATA PREPARATION AND PROGRAM DEBUGGING

AUTHOR: R. J. Loy

DIRECT TECHNICAL INQUIRIES TO:
R. J. Loy
IBM Corporation
606 Fayette Street
Peoria, Illinois 61603

*** N - - 04.1 04.3 - - - - - ***

DESCRIPTION - This utility program is designed as a programmer's aid in debugging or in test data preparation. However, others often have a need to print selected records when an immediate answer is required. The program has the capability of selecting records based on up to 10 scan parameters which may be combined in any mix of the following... greater than... equal to... less than... not equal to.

PROGRAMMING SYSTEMS - The program is written in Assembler Language and uses physical IOCS and Decimal Arithmetic, and DOS or TOS.

MINIMUM SYSTEM REQUIREMENTS - Can be run on any S/360 with TOS or DOS capabilities. Supervisor must have specified operator communications when system was generated.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003023

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.3.024
"DILTPPRT" A PROGRAM TO PRINT AND/OR SEARCH AND PRINT MAGNETIC TAPE

AUTHOR: B. H. Dilley

DIRECT TECHNICAL INQUIRIES TO:
B. H. Dilley
The Nobart Manufacturing Company
711 Pennsylvania Avenue
Troy, Ohio

*** N - - 04.0 - - - - - - ***

DESCRIPTION - To provide an EASY to use tape to print utility program which yields a listing which is USEABLE for debugging. SEARCH for a given KEY may be done before printing begins. Tapes with block length up to 3200 bytes may be printed. User must submit a control card containing the record length to gain most usable listing. The problem program size is 23K. Assembly is not required unless user wants to modify symbolic assignments, increase or decrease program size, etc. Normally 3 lines are printed. The top line is the BCD version of the data. The 2nd line is a representation of the left 4 bits of a byte. The

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3rd line is a representation of the right 4 bits of a byte. Records are deblocked in increments of 100 bytes. Each record begins on a new print line. An example of output follows:

NOW IS THE TIME
DDE4CE4ECC4ECDC0137024002B
565092038503955024C13D00AD

Above is alphameric above is packed decimal or binary

A control card option allows you to print the 1st line only where you do not have packed or binary fields. A control card option allows you to print the 2nd and 3rd lines only if desired.

PROGRAMMING SYSTEMS - Written with DOS ALC and user macros. The program runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - 360/30, DOS, 32K or greater, Decimal Instruction Set, 1 magnetic tape drive, a 2540 Card Reader, a 1052 Typewriter, a 1403 Printer. User may run on less than 32K by removing I/O areas and/or decreasing maximum block size.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003024

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.025
S/360 DOS TAPE TO PRINTER/PUNCH SPOOLING SYSTEM

AUTHOR: J. A. Cassidy

DIRECT TECHNICAL INQUIRIES TO:
J. A. Cassidy
IBM Chicago North Office
33 N. Dearborn Street
Chicago, Illinois 60602

*** N - - 195 294 - - - - - ***

DESCRIPTION - Program print/punches data from magnetic tape created for spooling. It accepts output from DOS SYSOUT, OS SYSOUT, COS and all programming languages. Output is identical to "On-Line" printing. Handles intermixed blocked/unblocked fixed/variable length printer and/or punch records. Handles multi-job, multi-file and multi-volume labeled and unlabeled tapes. Prints multiple copies. Provides for forms changes, flip-flops multiple input tapes. Accounting routine punches cards containing job name, date, elapsed job and spool time, number of input/output records, operator and machine identification. Very significant increase in thruput. One program handles all spooled output, provides accounting information, eliminates special tape and program handling.

PROGRAMMING SYSTEMS - Written in DOS Assembler.

MINIMUM SYSTEM REQUIREMENTS - 1 magnetic tape drive, 2540, 1403 console. Read/write channel switch desirable. Uses 6K to 10K partition.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003025

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.3.026 *N
FORTRAN TAPE DISK READ WRITE SUBROUTINES

AUTHOR: H. P. Sieglaff

DIRECT TECHNICAL INQUIRIES TO:
H. P. Sieglaff
3610 W. Northview
Phoenix, Arizona 85021

*** N - - 00.4 07.6 08.8 - - - - ***

DESCRIPTION - The READ subroutine provides the FORTRAN

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programmer with a means to read a 7 or 9 track tape with a minimum of difficulty. The WRITE subroutine provides the FORTRAN programmer with a means to write constant size (fixed length) records consisting of any type or mixture of variable(s).

PROGRAMMING SYSTEMS - The READ/WRITE subroutines are written in OS Assembly language F and require 656 and 680 bytes of core respectively.

MINIMUM SYSTEM REQUIREMENTS - The READ subroutine has been tested with Burroughs CDC, and IBM tapes as well as with sequential data sets on an IBM 2311 Disk Pack. The WRITE subroutine has been tested with the following information containers manufactured by IBM: 9 track tape, 2311 Disk Pack, and 2314 Disk Pack. The subroutines should work on any S/360 machine which has OS and FORTRAN G or H.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003026

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.027
SEVEN TRACK OCTAL TAPE DUMP

AUTHOR: M. W. Bate

DIRECT TECHNICAL INQUIRIES TO:
M. W. Bate
11 Carleton Street
Cambridge, Massachusetts 02142

*** C 1776 - 04.1 - - - - - - ***

DESCRIPTION - An Octal printout format is often useful for interpreting 7 track tapes that were prepared on 2nd generation equipment, especially the IBM 7000 series. This octal dump program can print out multiple file tapes.

PROGRAMMING SYSTEMS - Written in DOS Assembler language and operates using DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS, plus at least one 7 track tape drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D003027

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.3.028 *N
1400 INPUT/OUTPUT STANDARD LABEL PROCESSING EXITS FOR 483 DISK AND TAPE SORT

AUTHOR: G.S. Cornell

DIRECT TECHNICAL INQUIRIES TO:
G.S. Cornell
County of Nassau
Bureau of Management Information
Old Court House
Mineola, New York 11501

*** N - - - - - - - - - ***

DESCRIPTION - These two exit routines are designed to process 1400 input and output standard tape labels under the DOS Tape & Disk Sort/Merge (360N-SM-483). Multifile and multireel processsing is supported, but deblocking is not supported. Mixed 360 standard labels and 1400 standard labels are supported on input. Label errors are handled under the control of computer operator via the console typewriter. The routines must be cataloged in the user's Core Image Library. They are self-relocating, therefore, able to operate in any batched partition with the SORT program. This routine should be of value to installations having large core and using 1400 emulation. It will allow them to take advantage of the increased speed and foreground capabilities of the 483 Sort when working with 1400 tapes.

PROGRAMMING SYSTEMS - The exits are written in Assembler language and were assembled under DOS Release 18. The exits were tested under DOS Release 19.

CONTINUED FROM PRIOR COLUMN

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30 and any hardware required by DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003028

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.3.029 *N
TAPE FILE EXTENSION MACRO - INSTRUCTION

AUTHOR: Renah Ostrinsky

DIRECT TECHNICAL INQUIRIES TO:
Renah Ostrinsky
Brooklyn College Computer Center
Brooklyn, New York 11210

*** C 1026 - 06.2 03.7 - - - - - ***

DESCRIPTION - This macro allows the user to add records to an existing labeled tape file under DOS, eliminating the need for copying a file when making additions to it.

PROGRAMMING SYSTEMS - Written in Assembly language; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D003029

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.001
LISTER FOR VOLUME TABLE OF CONTENTS

AUTHOR: H. R. Tuck

DIRECT TECHNICAL INQUIRIES TO:
H. R. Tuck
IBM Corporation
370 W. First St.
Dayton, Ohio

*** N - - 06.8 - - - - - - ***

DESCRIPTION - VTOC Lists on SYSLST the Volume Table of Contents of a disk pack for a 2311 Disk Drive. VTOC standard or VTOC for systems residence on Cylinder 199 tracks 0-9 is acceptable. All non-zero labels are displayed with dates and extents converted to decimal.

PROGRAMMING SYSTEMS - Written in 360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Program runs under 8K BOS Disk System. Configuration - Minimum 8K BOS Disk.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.002
UTILITY FOR SELECTIVE CHANGES TO 2311 RECORDS FROM CARDS UNDER S/360 BOS

AUTHOR: R. E. Bennett

DIRECT TECHNICAL INQUIRIES TO:
R. E. Bennett

CONTINUED FROM PRIOR PAGE

IBM Corporation
1000 James St.
Syracuse, N. Y. 13203

*** N - - 01.1 01.6 06.2 - - - - ***

DESCRIPTION - The purpose of this program is to selectively load data fields from cards to 2311 disk records on a random update basis. Under the S/360 Basic Operating System, the current Card-to-Disk Utility, is a disk record create program. Therefore, any previous data on disk is destroyed by the operation (processing consecutively). Although the record thus created may be any size, the user may load only the 80 characters of one card (subsequent passes against the same file may create entirely new files). The program as submitted permits changing existing files without destroying unaffected fields, allowing also the building of any size record (limit of one track) from cards, via multiple passes when necessary. The field select card is compatible with the IBM Utilities.

PROGRAMMING SYSTEMS - Operates under S/360 BOS.

MINIMUM SYSTEM REQUIREMENTS - Those required for 8K BOS, but should be easily adaptable to more general use. Packing is possible. Changes to the key fields may be made.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.004
EMULATOR-TO-DISK

AUTHORS: R. Grotz L. Carney

DIRECT TECHNICAL INQUIRIES TO:
R. Grotz
Douglas Aircraft Co., Inc.
Long Beach, Calif.

*** N NA EMTD 01.5 00.5 05.5 11.1 - - - ***

DESCRIPTION - The purpose of this program is to place an initialized 7090/94 Emulator or the 7040 Emulator onto a 2311 Disk Pack in such a manner as to allow initial program loading (IPL'ing) of the emulator from the disk pack, and in a format which is compatible with OS/360's usage of direct-access devices.

PROGRAMMING SYSTEMS - Requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 165 with a 1052 Console, one 2311 Disk Drive, one tape unit and one card reader is required. Once the initialized emulator has been loaded into core from its original resident volume, this program places the necessary IPL text on cylinder 0, track 0, and then copies the emulator onto the DASDied target pack in track images which consist of two records. Record one consists of the channel program required to read the emulator text (contained in record two), into its respective area of core, to initiate a seek and search for the next track, and to transfer channel control to record one of the next track. The self-loading channel program loop is terminated by turning off command chaining in the channel command word which reads the record containing the last segment of the emulator into core, at which time the preset IPL PSW transfers control to the emulator IPL routine. This program is intended for use as a stand-alone utility deck for those installations having a 7090/94 or a 7040 Emulator.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.005
INITIALIZE DISK UNDER DOS-V2

AUTHOR: Mr. D. A. Buesing

DIRECT TECHNICAL INQUIRIES TO:
Mr. D. A. Buesing
IBM Corporation

CONTINUED FROM PRIOR COLUMN

650 N. Main St.
Rockford, Ill. 61101

*** N - - 00.0 01.0 - - - - - ***

DESCRIPTION - This program is a disk initialization program that executes in a foreground partition in a multiprogramming environment under DOS-V2. All program input is via the console typewriter. Program to operator communication is self-explanatory and displayed on the console typewriter. A check is made that the disk to be initialized is not SYSRES. The volume label of the disk to be initialized is listed on the console typewriter at which time the operator has an option to start execution. Features include - IPL and VTOC record creation; home address generation; surface analysis; track descriptor record generation; and volume label creation.

PROGRAMMING SYSTEMS - Written in Assembler Language at the EXCP level and requires DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Two disk drives (SYSRES and drive for disk to be initialized) and minimum foreground size of 6K. Compatability Operating System (COS) disk initialization is possible.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.006
DOS CORE-IMAGE LIBRARY TRANSFER PROGRAM

AUTHOR: Mr. R. A. Claeys

DIRECT TECHNICAL INQUIRIES TO:
Mr. R. A. Claeys
IBM Corporation
P. O. Box 2900
Jacksonville, Fla. 32203

*** N - - - - - - - - - ***

DESCRIPTION - A DOS service utility program.

PROGRAMMING SYSTEMS - Written in Assembly Language which allows programs on one core-image library to be transferred to another DOS systems pack. A separate control statement card (TRANS card) is needed for each phase or program to be transferred. The program is compatible with other DOS service functions and both the system and core-image directory are updated to reflect the current status.

MINIMUM SYSTEM REQUIREMENTS - DOS configuration - reader, printer, 2 disk drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.007
MODEL 44 DISK SUPPORT PACKAGE

AUTHOR: Mr. D. A. Duffield

DIRECT TECHNICAL INQUIRIES TO:
Mr. D. A. Duffield
IBM Corporation
540 E. Main Street
Rochester, N. Y. 14604

*** N - - 01.1 06.7 - - - - - ***

DESCRIPTION - The following is a description of the System/360 Model 44 Disk Support Package which, when used in conjunction with BPS FORTRAN, will provide the user with a convenient means for program and data storage on the integrated disk storage drive. Three FORTRAN-callable subroutines are used for the storage and retrieval of data- define for file definition; WDISK for the writing of data; and RDISK for the reading of data. DEFINE will specify the number of records and the length (in 32-bit words) of each record. RDISK and WDISK will specify the record number to be accessed and an area into (or out of) which

CONTINUED FROM PRIOR PAGE

the data should be read (or written). Currently only one file may reside on a pack so file number need not be specified in the subroutine calls. A fourth FORTRAN-callable subroutine, LINK, allows the user to load and execute a program previously stored on the disk pack. Large programs may now be subdivided and the segments stored on the disk. The time delay between the issue of a CALL LINK and the beginning of execution of the program linked to, is in the order of one second. Twenty-two programs may be stored per pack for a system with 64K bytes of core storage. The user will specify the program to be loaded in a LINK subroutine call of the program to be overlaid. Backing up the LINK subprograms are three utilities for program storage and maintenance. STORE will take the object code from core storage and place it in the first available slot on a 2315 Disk Pack. The program name (taken from the FTC card), identification number and size are placed in a dictionary on track No. 0. DELETE will remove a program from the pack and make that slot available for storage of another program. DMPTBL will print out on device No. 3 the current contents of a disk pack. INITAL will initialize a disk pack for program storage making that pack un-define-able so that programs will not inadvertently be overwritten with data. WDADR will write addresses on a disk pack. The addresses are used by both the program and data storage routines for checking seek operations. Currently a disk pack cannot be used for both program storage and data storage. Therefore, programs stored on a disk should not expect to use that same pack for temporary data storage. However, if the system has the second drive, a slight modification to the routines will allow one drive to be used for data storage and the other for program storage.

PROGRAMMING SYSTEMS - This program was written to work in conjunction with the Model 44 BPS FORTRAN system on magnetic tape.

MINIMUM SYSTEM REQUIREMENTS - 64K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 36D004007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.009
DOS STACKED JOB TIME RECORDING PROGRAM - EL-TAS

AUTHOR: Mr. H. L. Morse

DIRECT TECHNICAL INQUIRIES TO:
Mr. H. L. Morse
IBM Corporation
570 Broad St.
Newark, N. J. 07102

*** N - - 00.0 20.0 19.0 - - - - ***

DESCRIPTION - EL-TAS is a series of 3 programs which provide elapsed time recording in a DOS stacked job environment. The program records the start and stop time on a disk file along with any information desired by the user. The disk file is built until the end of the job stream at which time the user prints a report containing one line item per disk record. At the same time the report is printed a card is punched for each line item. This program was designed mainly for use by datacenters using the installation center concept of testing, thus the input-output formats are geared to IBM's own accounting systems. Other users may use the program by either adapting their user job information to fit the input-output provided by the program or they may alter the program to suit their needs.

MINIMUM SYSTEM REQUIREMENTS - 360 CPU, 16K with timer feature, 1403 Printer, 2540 Card Read Punch, 1050 Console Typewriter, at least 1 2311 Disk Drive; Decimal Instruction Set.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.4.010
DISK PACK AUTOMATIC CATALOGING

AUTHOR: R. G. Bayer

DIRECT TECHNICAL INQUIRIES TO:
R. G. Bayer
IBM Corporation
2125 Biscayne Blvd.
Miami, Fla.

*** N - - - - - - - - - ***

DESCRIPTION - DPAC is a three part programming system for automatically keeping a current catalog of disk space utilization. Phase 1 formats the catalog on the system resident 1316 and enters a label in the system resident volume table of contents, so that the catalog can be accessed logically. Phase 2 catalogs on the system resident pack information from all on-line 1316's when any file is created. Phase 3 prints on request a two page report per 1316 on all 1316's. Page 1 shows the file label, volume sequence number of the originating volume, volume number, creation and expiration date, extent type and sequence, and the upper and lower limits of all the files on the 1316. If a file has expired, it is flagged with an asterisk. Page 2 is a listing of the available cylinders on the 1316.

PROGRAMMING SYSTEMS - Runs under BOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 2030D with Decimal Arithmetic feature under BOS. Can be modified to run under DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.012
S/360 OPERATING SYSTEM LABEL CHANGER

AUTHOR: P. H. Ayles

DIRECT TECHNICAL INQUIRIES TO:
P. H. Ayles
IBM Corporation
5 Place Ville Marie
Montreal, P. Q., Canada

*** N - - - - - - - - - ***

DESCRIPTION - This program will change the label of any S/360 direct access volume which has been initialized using the IBM DASDI program, e.g., 2311, 2314, 2321, etc. It will also list the space available on any such volume.

PROGRAMMING SYSTEMS - Runs under Operating System/360 and is written in Assembler F.

MINIMUM SYSTEM REQUIREMENTS - A 1052 Console Typewriter. Core requirements are approximately 1800 bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.013
SYSTEM/360 OPERATING SYSTEM DIRECT ACCESS DEVICE DUMP PROGRAM

AUTHOR: R. Goldner

DIRECT TECHNICAL INQUIRIES TO:
R. Goldner
IBM Corporation
330 Madison Avenue
New York, N. Y.

*** N - - - - - - - - - ***

DESCRIPTION - OSDUMP will dump a direct access device without having to run a stand-alone program.

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PROGRAMMING SYSTEMS - OSDUMP was written in Basic Assembler Language; runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - CSDUMP will run under any configuration of the Operating System; requires 10,256 bytes of core storage to operate.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.014
CHANGE1 - OS/360 DASD EXPIRATION DATE WRITER

AUTHOR: J. E. North

DIRECT TECHNICAL INQUIRIES TO:
J. E. North
IIT Research Inst.
Programming Systems Group
10 West 35th Street
Chicago, Illinois 60616

*** S ARF JN011 00.5 06.7 - - - - - ***

DESCRIPTION - CHANGE1 writes an expiration date for any dataset residing on a direct access volume of the device types supported by OS/360. The program has been tested on the Models 40, 50, 65, and 75 in the PCP.14, MFT-HASP.14, MVT.14, and EMFT.13 environments. CHANGE1 receives all of its input from the JCL which invokes the utility. The VTOC is searched for a format-one OSCB whose DSNAME is that of the DD statement. That OSCB is read, the new expiration date, obtained from the PARM parameter of the EXEC statement, is added, and the DSCB is written back into the VTOC. One expiration date is written per step, and the time is virtually that of the scheduler. CHANGE1 is primarily a systems program, but it can easily be used by the applications programmer.

PROGRAMMING SYSTEMS - Programming language - OS Assembler Language. Operating system - OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.4.015
DAP DIRECT ACCESS PATCH PROGRAM

AUTHOR: A. B. Nestiuk

DIRECT TECHNICAL INQUIRIES TO:
A. B. Nestiuk
1033 North Francisco
Chicago, Illinois 60622

*** N - - 00.5 06.7 07.0 08.0 - - - ***

DESCRIPTION - The Direct Access Patch Program is designed to provide on-line capabilities to alter contents of 2311, 2314, and/or 2321 DASD devices.

PROGRAMMING SYSTEMS - Written in Assembler language and has been run on DOS Version III.

MINIMUM SYSTEM REQUIREMENTS - DAP is self-relocating, and requires 10K to operate. DOS File-Protection is suppressed through two BETA transients, submitted with the program. DAP requires one 1052 Console Typewriter and a DASD device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D004015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

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360D-00.4.018 *N
IBM SYSTEM/360 INDEXED SEQUENTIAL DASD TO PRINT UTILITY

AUTHOR: R.S. Trigg, Jr.

DIRECT TECHNICAL INQUIRIES TO:
R.S. Trigg, Jr.
1111 Cardenas Dr. SE
Albuquerque, New Mexico 87108

*** N - - 03.4 08.5 - - - - - ***

DESCRIPTION - The Indexed Sequential DASD to Print Utility is designed to provide System/360 DOS users both random and sequential dumping of an ISAM file. Control cards are used to define both the file and the options within the access method that are desired. A system of defaults allows a file to be dumped even though no control cards are used. After all control cards have been analyzed, the Indexed Sequential file is opened and file statistics from the Format 1 and Format 2 labels are printed. The hexidecimal dump that follows prints fifty bytes (one-hundred hex digits) per line. Records in one of the overflow areas are flagged.

PROGRAMMING SYSTEMS - Written in 360/DOS Assembly language.

MINIMUM SYSTEM REQUIREMENTS - (1) System/360 Model 30, 32K Storage, operating under DOS. (2) Decimal arithmetic. (3) Control Card Input, 2540 Card Reader assigned to SYSIPT. Both the device type and/or logical unit name may be changed by altering the DTFCD (Sequence Number 010-013 in the source program). (4) Printed Output - 1403 Printer assigned to SYSLST. Both the device type and/or logical unit name may be changed by altering the DTFPR (Sequence Number 014-018 in the source program). The printed output consists of 121 position records with the ASA Control Character in position 1. (5) Whatever DASD required for operation by the user.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D004018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-00.5.001
INITIALIZE DATA CELL STRIP

AUTHOR: H. H. Towell

DIRECT TECHNICAL INQUIRIES TO:
H. H. Towell
IBM Corporation
570 Broad Street
Newark, N. J. 07102

*** N - - 00.4 04.3 06.7 - - - - ***

DESCRIPTION - This is a stand-alone program which writes home addresses and track descriptor records on one or more data cell strips. It also checks the data portion of each track by writing and reading a 2000 byte record of hexi decimal "FF". It will enable the user initialize a single data cell strip instead of initializing an entire cell.

PROGRAMMING SYSTEMS - The program was written in Assembler Language and assembled using 8K BOS.

MINIMUM SYSTEM REQUIREMENTS - A System/360 Model 30 with 8K of storage, 1 card reader, 1 printer, 1 typewriter, and 1 data cell drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D005001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.5.002
CALCDASD - A S/360 TOS/DOS COBOL PROGRAM TO CALCULATE NUMERICAL CHARACTERISTICS OF FILES FOR DASD UNITS FOR GIVEN RECORDS

AUTHOR: R. K. Goran

DIRECT TECHNICAL INQUIRIES TO:
R. K. Goran
IBM Corporation
520 Boylston Street
Boston, Mass. 02116

*** N - - - - - - - - - - ***

DESCRIPTION - This program will compute the number of characters, logical records and blocks per track, for a blocking factor of 1 to the maximum permissible, for any of the supported devices. The DASD supported are 2301, 2302, 2303, 2311, 2314 and 2321.

PROGRAMMING SYSTEMS - The program is written in TOS/DOS COBOL.

MINIMUM SYSTEM REQUIREMENTS - 64K - however, alterations can be made for 24K or 32K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D005002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.5.004
DIRECT-ACCESS DEVICE DESCRIPTOR PROGRAM

AUTHOR: J. S. Scandale

DIRECT TECHNICAL INQUIRIES TO:
J. S. Scandale
Cornell Aeronautical Laboratory, Inc.
4455 Genesee Street
Buffalo, N. Y. 14221

*** N - - - - - - - - - ***

DESCRIPTION - The purpose of this program is to list the names and certain characteristics of all data-sets on resident direct access volumes. Free-area extents are listed and summed. Each data set will be represented by its size, number of extents, pertinent characteristics such as organization, block length, key-position, etc. Since the program scans the UCB look-up table in the nucleus, it will not function correctly on a system which incorporates hardware fetch-protection of core storage. Information provided is that which can be found in the Volume Table-of-Contents, data-set-control-blocks formats 1 through 6.

PROGRAMMING SYSTEMS - Runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - 64K bytes of main storage, one console device, two direct-access drives, one card reader, one card punch, one printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D005004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.5.005
FORMATTED LISTING OF VTOC FOR OS/360

AUTHOR: J. W. Woolfolk, III J. C. Rather

DIRECT TECHNICAL INQUIRIES TO:
J. W. Woolfolk, III
P.O. Box 53038
New Orleans, La. 70150

*** N - - - - - - - - - ***

DESCRIPTION - This program provides the user with an easily readable listing of the VTOC of an OS/360 2311 or 2314 volume. All numeric information is in decimal and identified by keywords or headings. The information provided includes data set name, file organization, extents,

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total current space allocation, allocation type (CYL, TRK, etc.), secondary allocation quantity, creation and expiration dates, and DCB information. For partitioned and sequential files, the number of tracks used is given. For fixed length-record sequential files, the number of records is calculated. Selected statistical information is provided for indexed sequential data sets. A volume summary provides a list of the size of all free extents and the total free area. The program alsc provides an optional link of IEHLIST to produce catalog and PDS directory listings in the same step.

PROGRAMMING SYSTEMS - Written in PL/1 and BAL.

MINIMUM SYSTEM REQUIREMENTS - An OS/360 system with PL/1 and a 60K region.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D005005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.5.006
SHAREDISK

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
D. Jacobs
Martin Marietta Corporation
P.O. Box 5837, MP - 423
Orlando, Florida 32805

*** N - SDSK 05.1 10.2 - - - - - ***

DESCRIPTION - SHAREDISK allows the simultaneous updating of System Libraries from different sources with no danger of destroying cr losing information. The user indicates to SHAREDISK which data set is to be updated and which program is to do the updating. SHAREDISK, in turn, prevents any other user from gaining access to the library while the updating is taking place. Therefore, it is not necessary to specify "DISP=OLD" when updating System Libraries but, instead, to execute SHAREDISK and specify "DISP=SHR". This cuts the "lock-out" time to only that between issuance of a "RESERVE" macro and its corresponding "DEQ" macro. SHAREDISK requires an additional 740 bytes of core to run and can, if desired, be placed in the link-pack-area, since it is reentrant.

PROGRAMMING SYSTEMS - Written in 360 OS Assembler language F. Has been tested utilizing MVT, Release 15/16 with Share File Support.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run under OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D005006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.6.001 *M
DATA SET EDITING WITH A GRAPHIC DEVICE

AUTHOR: D. R. Christiansen

DIRECT TECHNICAL INQUIRIES TO:
D. R. Christiansen
IBM Corporation
9045 Lincoln Blvd.
Los Angeles, California 90045

*** N - - - - - - - - - ***

DESCRIPTION - DSEDIT is a graphic application program for the IBM 2250 Model 1. It can be used to maintain card files that reside on IBM 1311 Disk Packs. Through the use of the IBM 2250 the user can view and update his card decks. The decks may exist as sequential data sets or members of partition data sets. Access to several data sets in a single run is supported and a mix of sequential and partition data sets per single run is allowed. Creation of new data sets or new members are also supported. DSEDIT

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uses GPAK, a IBM Type III program for image generation and attention handling.

PROGRAMMING SYSTEMS - OS/360 with Express Graphic Support. Programs are a mix of FORTRAN E and BAL. Load module is approximately 64K bytes.

MINIMUM SYSTEM REQUIREMENTS - System/360 CPU with a 2311 Disk Drive, and a Model I 2250 equipped with light pen, character generator, absolute vectors, and a alphanumeric keyboard.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.6.002
GRAPHIC DISPLAY OF DATA SETS USING OS/360

AUTHOR: W. A. Gower

DIRECT TECHNICAL INQUIRIES TO:
W. A. Gower
IBM Corporation
System/360 Programming Center
Poughkeepsie, N. Y. 12603

*** N - - 04.0 - - - - - - ***

DESCRIPTION - Graphic Display of Data Sets Using OS/360 is an Assembly Language program which interfaces with the "IEBPTPCH" Data Set Utility Program under OS/360 to display sequential or partitioned data sets, (with or without printed copy), on the IBM 2250.

FEATURES -
- Data sets to be displayed are indicated through the use of the standard control cards of the utility program.
- Data is displayed page-by-page under control of the 2250 operator.
- The contents of one data definition card indicate the inclusion or exclusion of printed copy.
- Operates in an Option 2 (MFT) environment.
- Provides real-time list of the catalog and Volume Table of Contents (VTOC).

PROGRAMMING SYSTEMS - Operates under OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.6.003
IBM 2250 EXPERIMENTAL DRAFTING AND SCHEMATIC PACKAGE

AUTHOR: D. A. Hollo

DIRECT TECHNICAL INQUIRIES TO:
D. A. Hollo
IBM Corporation
Gateway Center
Pittsburgh, Pa. 15222

*** N - - 06.6 - - - - - - ***

DESCRIPTION - The IBM 2250 Experimental Drafting and Schematic Package provides the user with the capability of drawing points, lines, circles, dimension lines, and other elements normally required for drafting applications. In addition, schematic capability exists by allowing prestored shapes to be generated and manipulated with the system.

PROGRAMMING SYSTEMS - The program is written under Basic Programming Support FORTRAN IV, Level D, tape 16K. The program uses routines developed in the Graphic FORTRAN System (library number 360D-03.4.004) and therefore must be used in operating this program.

MINIMUM SYSTEM REQUIREMENTS - The system requires a single, dedicated IBM 2250 Display Unit, Model 1 with buffer storage, character generator, Absolute Vector feature, light pen, and function keyboard.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.6.004
ALPHANUMERIC DISPLAY PACKAGE FOR THE IBM 2250

AUTHORS: J. T. Wood J. L. Thomas

DIRECT TECHNICAL INQUIRIES TO:
J. T. Wood
IBM Corporation
1120 Connecticut Ave., N.W.
Washington, D. C. 20036

*** N - - 04.2 03.7 - - - - - ***

DESCRIPTION - ALPHAPAC consists of a series of re-entrant sub-routines which provide macro level support. Using this package, a person can write and debug programs which use the 2250, and not be concerned about the graphic orders, buffer management, polling techniques, attention handling, raster units, x and y coordinates, and other details of the 2250 Display Unit.

PROGRAMMING SYSTEMS - This package, which was written in OS Assembler Language, uses the graphic support provided with Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 with a 4,096 byte buffer and a IBM 2250 Display Unit equipped with alphanumeric keyboard, and light pen.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.6.006
DUCS - DISPLAY UNIT CONTROL SYSTEM FOR IBM 2260 LOW COST DISPLAY UNITS

AUTHOR: R. K. Goran

DIRECT TECHNICAL INQUIRIES TO:
R. K. Goran
IBM Corp.
520 Boylston St.
Boston, Mass. 02116

*** N - - - - - - - - - ***

DESCRIPTION - The Display Unit Control System, DUCS, will provide complete support for local IBM 2260 low cost Display Units, including the data entry models. It can be used by problem programs written in PL/I, COBOL, or Assembler Language and is referenced by standard call statements. The user need not have any knowledge of Assembler to implement DUCS. With DUCS, the need for BTAM for the support of locally attached 2260 Display Units is eliminated. Also teleprocessing support need not be specified in the user tailored supervisor thus allowing the user to specify an 8K system to support 2260's in a multiprogramming environment. Any number of display units can be run with DUCS. Also asynchronous interrupt handling along with many other features not found in BTAM are intrinsic functions of DUCS.

PROGRAMMING SYSTEMS - Runs under control of either the Tape Operating System or the Disk Operating System, (without concern of release sensitivity known to date).

MINIMUM SYSTEM REQUIREMENTS - An 8K system to support 2260 Display Units in a multiprogramming environment.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006006

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.6.007
GDUMP - TRANSLATION OF 2250 GRAPHIC DATA USING OS/360

AUTHOR: W. A. Gower

DIRECT TECHNICAL INQUIRIES TO:
W. A. Gower
IBM Corporation
Bldg. 985, Rt. 55
Poughkeepsie, New York 12603

*** N - - - - - - - - - - ***

DESCRIPTION - This is an Assembly Language subroutine to dump a specified area of 2250 buffer when invoked by a user program. Features of this program are - (1) It can be invoked dynamically to provide snapshots of the 2250 buffer contents; (2) it can be used by the Assembly Language Graphic Program or the FORTRAN Graphic Program; (3) The contents of one data definition card indicate the output device to be used (printer, tape, etc.); execution depending on the parameter provided; (5) All of the 2250 buffer or any part can be dumped depending cn the parameters; (6) The output can be either uninterpreted hexadecimal or English translation for the nongraphic oriented individual; (7) It does not interfere with the images being displayed.

PROGRAMMING SYSTEMS - Programming language - Source - ALP. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-00.6.008
IO2260 DISPLAY/ATTENTION PACKAGE

AUTHOR: H. A. Garner

DIRECT TECHNICAL INQUIRIES TO:
H. A. Garner
IBM Corporation
2930 W. Imperial Highway
Inglewood, California 90303

*** S IIC - - - - - - - - ***

DESCRIPTION - The IO2260 Display/Attention Package provides a means for the FORTRAN or Assembly Language programmer to control any number of IBM 2260's, with calls from FORTRAN, or similar code in Assembly programs, in a 44/PS environment.

PROGRAMMING SYSTEMS - Operating system required - Unmodified 44/PS, and uses the IO and scheduling services of that system.

MINIMUM SYSTEM REQUIREMENTS - Those required for 44/PS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-00.6.009
PL/I GRAPHICS SUBROUTINE PACKAGE

AUTHOR: W. Speary

DIRECT TECHNICAL INQUIRIES TO:

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W. Speary
DCRT, Computer Center
National Institutes of Health
Bethesda, Maryland 20014

*** N - - 03.4 08.7 - - - - - ***

DESCRIPTION - The PL/I Graphic Subroutine Package is designed to enable the programmer to communicate with the IBM 2250-1 using OS PL/1, Version 3. The programmer, by using the package, can have access to the 2250-1 as well as the resources of PL/1. Calls to procedures, written in Assembly Language, enables the programmer to send data to and from the display. Interrupts are handled by user-defined ON-conditions. The subroutines included in the IBM System/360 Operating System, Graphic Programming Services for the IBM 2250 Display Unit, Form C27-6909, are also made accessible to the programmer.

PROGRAMMING SYSTEMS - Programming language - Assembler Language. Operating system required - OS PL/I.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30, Model 1 2250.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-00.6.011 *N
A HYPERTEXT EDITING SYSTEM FOR THE S/360 USING THE 2250 DISPLAY

AUTHOR: Andries van Dam

DIRECT TECHNICAL INQUIRIES TO:
Andries van Dam
Center for Computer & Information Sciences
Brown University
Providence, R. I. 02912

*** S BUC - 06.6 06.7 29.4 - - - - ***

DESCRIPTION - The Hypertext Editing System is a multipurpose text handling system which can be used for text editing and revision, information retrieval, programmed learning, typesetting (through IBM's TEXT 360 program), and the presentation of non-sequential forms of writing, called hypertext.

PROGRAMMING SYSTEM - The system was written in Assembly language.

MINIMUM SYSTEM REQUIREMENTS - The system will run on the IBM System 360/40 and up with at least 128K of core storage, under control of PCP, MFT (in a 108K partition), or MVT (in a 108K region). It currently supports either the 2250 Model I (with an 8K buffer and the Graphic Design feature) or the 2250 Model III, and requires at least one 2311 or 2314 Disk Drive, and a 1403 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D006011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-01.0.004
S/360 FACILITY SUBROUTINES

AUTHOR: R. K. Goran

DIRECT TECHNICAL INQUIRIES TO:
R. K. Goran
IBM Corp.
Field Systems Center
520 Boylston St.
Boston, Mass. 02116

*** N - - - - - - - - - ***

DESCRIPTION - The S/360 Facility Subroutines were written to give the S/360 programmer greater magnitude in the use of S/360 features not supported by the specific language translators being used. The subroutines utilize the

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standard Assembler Language macros to permit the higher level language programs to have access to the storage print facility, the communication region dates, the Interval Timer, the User Program switch Indicator, (UPSI byte), and the External Interrupt Key.

PROGRAMMING SYSTEMS - The subroutines may be used by any of the language translator object programs under the Tape and Disk Operating Systems.

MINIMUM SYSTEM REQUIREMENTS - With the exception of the Interval Timer subroutines and the subroutine to ring the Audible Alarm, all of which require the Interval Timer feature, there is no minimum configuration requirement.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D010004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.0.005
IBM OPERATING SYSTEM/360 BRAILLE UTILITY PROGRAM

AUTHORS: G. N. Lefelar B. Lagrone

DIRECT TECHNICAL INQUIRIES TO:
G. N. Lefelar
IBM Corp.
1120 Connecticut Ave., N. W.
Washington, D. C. 20036

*** N - - - - - - - - - - ***

DESCRIPTION - The System/360 Operating System Braille Utility is a general purpose program designed to translate cards, magnetic tape, and direct-access input into grade 1 Braille on an IBM 1403 Printer. The program is also designed to translate any IBM SRL manuals that are contained on TEXT 90 print tapes into Braille.

PROGRAMMING SYSTEMS - Source written in Assembler Language; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Any model CPU that can accommodate Operating System/360, plus a 1403 Printer, 2540 Card Reader/Punch, and a 1052 Console Typewriter.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D010005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.0.006 *M
IBM SYSTEM/360 BRAILLE UTILITY PROGRAM

AUTHOR: G.N. Lefelar

DIRECT TECHNICAL INQUIRIES TO:
G.N. Lefelar
IBM Corporation
1120 Connecticut Avenue, N.W.
Washington, D.C. 20036

*** N - - - - - - - - - - ***

DESCRIPTION - This program is designed to translate its input into readable Grade 1 Braille on a standard IBM 1403 Printer. Braille is a touch reading system used by blind individuals, consisting of a configuration of dots in a 2-by-3 matrix.

This program consists of four parts:
1. BPS/360 Absolute Loader (program no. 360P-UT-017).
2. System control cards (distinguished by 2 slashes in card columns one and two).
3. Object program cards constituting the braille program proper.
4. A source deck for the System/360 Braille Utility Program This will be used to place the program in a BOS or DOS Library.

PROGRAMMING SYSTEMS - Written in (Source) S/360 Assembler Language. (BOS).

MINIMUM SYSTEM REQUIREMENTS - 360/30 with 16K core storage, 1403 Printer, 2540 Reader/Punch, and disks or tapes (9-track

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or 7-track with the Translate and Data Conversion features) as needed.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D010006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-01.0.007
SYSTEM/360 BINARY-TO-DECIMAL OR DECIMAL-TO-BINARY CONVERSION UTILITY PROGRAM

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corp.
425 Park Ave.
New York, N. Y.

*** N - - - - - - - - - - ***

DESCRIPTION - This program will perform the stated functions and immediately print out the converted results on the console typewriter. It is useful in analyzing the contents of general purpose registers. It immediately creates the hexadecimal equivalents of all plus or minus decimal numbers up to 2,147,483,647. Either program routine can be selected by keying a special code letter. When in the Convert-to-Decimal mode, typing in a general register image such as 00BA7F0E causes to print out immediately on the next line, hex. FFFFFB2E equals 0,000,001,234-dec. When in the Convert-to-Binary mode, typing in 12345 causes to print out immediately, dec. 12345 equals 0003030 HFX. The eight character HFX. portion is a general register image after conversion. If the conversion is for means other than register simulation, the high-order zeros can be ignored.

PROGRAMMING SYSTEMS - Written in machine language.

MINIMUM SYSTEM REQUIREMENTS - Any System/360 with a reader and console typewriter on line.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D010007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.0.008
RETRIEVAL OF TIME AND/OR DATE FOR OS/360 COBOL PROGRAMS

AUTHOR: B. Camp

DIRECT TECHNICAL INQUIRIES TO:
B. Camp
IBM Corporation
P. O. Box 1900
Boulder, Colorado 80302

*** N - - - - - - - - - - ***

DESCRIPTION - An OS/360 Assembler Language subroutine which retrieves the time and/or date for an OS/360 COBOL program. By using the COBOL "CALL" and "USING" linkage facilities the programmer has access to the current time and/or date from OS/360. In order to obtain the time, the CPU Interval Timer feature is required. Both date and time are returned in packed decimal format. Date is in the format at 00YYDDS: where YY equals year and DDD equals day of year. Time is in the format HHMMSSTS; where the HH equals hour of day, MM equals minutes, SS equals seconds, and T equals tenths of a second. For both date and time the trailing "S" represents the sign of the packed decimal number.

PROGRAMMING SYSTEMS - Programming language - OS/360 Assembler Language. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360. (This routine occupies 96 bytes of core storage).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D010008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.0.009
OS/360 DATE AND TIME SUBROUTINE (DT01) WITH CONVERSION FROM JULIAN DATE TO GREGORIAN

AUTHOR: P. L. Edelsberg

DIRECT TECHNICAL INQUIRIES TO:
P. L. Edelsberg
IBM Corporation
440 Franklin Tpke.
Mahwah, New Jersey 07430

*** N - - 06.5 12.0 99.0 - - - - ***

DESCRIPTION - Subroutine DT01 allows the RPG or Assembler programmer to access the system date and/or time from the OS communications region. This routine accesses the date in Julian form (YYDDD) and converts it to the Gregorian form (MMDDYY). The system time may also be accessed in the form (HHMMSS). Editing may be performed in the RPG program to insert proper separation characters. This subroutine will convert any date and adjust for leap years, except year 2000.

PROGRAMMING SYSTEMS - Written in OS Assembler F, Release 16, and requires 496 bytes. The subroutine has run with a sample RPG program under release 14 and 16.

MINIMUM SYSTEM REQUIREMENTS - A 512K Model 50 with both PCP and MVT, although it should work on a minimum OS system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code, and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D010009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.1.001
CARD TO PAPER TAPE/MAGNETIC TAPE AND MAGNETIC TAPE TO PAPER TAPE PROGRAMS UNDER OS/360

AUTHOR: M. E. Morgan

DIRECT TECHNICAL INQUIRIES TO:
M. E. Morgan
IBM Corp.
1930 Century Park West
Los Angeles, California 90067

*** N - - - - - - - - - ***

DESCRIPTION - The Card to Paper Tape/Magnetic Tape program will punch paper tape or build a magnetic tape from Hollerith or column binary card input. The magnetic tape to paper tape program will punch paper tape from magnetic tape input.

PROGRAMMING SYSTEMS - Runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 under the Operating System; Decimal Arithmetic; IBM 1012 Paper Tape Punch; IBM 2821 Control Unit with Column Binary feature; IBM 1403 Printer; IBM 2400 Tape Unit with 9-track Read/Write Head; IBM 2540 Card Reader/Punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D011001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-01.1.004
S/360 REPETITIVE TAPE LOADER FOR STAND-ALONE CARD PROGRAMS

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corp.
425 Park Ave.
New York, N. Y.

*** N - - - - - - - - - ***

DESCRIPTION - This program loads a card program into core once and then writes it onto tape 10 times continuously. The original program can then be IPLed from tape 10 times before rewinding is necessary. Many frequently used programs will IPL and execute either from a card reader or from tape because the 02 read-command-codes of the included CCW's are common to both devices. Two such programs are the BPS Core Storage Print Utility 360P-UT-056, and the small Disk-Print Card Utility program which uses extents keyed in from the typewriter. In test sessions where many core dumps and/or disk prints are made, much valuable time is saved by bringing in these programs from tape. Card-handling and reader-ready time is eliminated. This program is also good for repetitive loading of machine diagnostic or test programs. The tape-load program consists of three cards. The amount of times that the desired card program will be repeated on tape can be either increased or decreased from 10.

PROGRAMMING SYSTEMS - Written in machine language.

MINIMUM SYSTEM REQUIREMENTS - Any System 360 with a 2540 Card Reader and a tape drive on line.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D011004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.1.005
DOS PROGRAM TO LOAD AND EXECUTE FROM CARD READER OR PRIVATE RELOCATABLE LIBRARY IN ANY PARTITION

AUTHOR: D. R. McIlvain

DIRECT TECHNICAL INQUIRIES TO:
D. R. McIlvain
Air Products & Chemicals, Inc.
P. O. Box 538
Allentown, Pa. 18105

*** C 1854 - - - - - - - - - ***

DESCRIPTION - This program was written to allow users with limited core image library space to load and execute programs in any partition. It also gives the equivalent of a private core image library by using a private relocatable library.

PROGRAMMING SYSTEMS - It consists of two Assembly Language programs running under DOS/360. The first, A6B705, is executed following a Link Edit, and produces the equivalent of a CSERV for the program just link-edited. The second, A6B704, is a self-relocating program which can be run in any partition. It will load from card reader or from a private relocatable library the decks produced by A6B705 (these may be self-relocating decks) and executes them.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D011005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.1.006 *N
COMPILE AND GO FOR THE OS 360 PL/1 (F) COMPILER

AUTHOR: G. Meacock

DIRECT TECHNICAL INQUIRIES TO:
G. Meacock
IBM U.K. Laboratories Ltd.

CONTINUED FROM PRIOR PAGE

Hursley Park
Winchester, Hants., England

*** N - - Ø3.2 Ø5.1 - - - - - ***

DESCRIPTION - This program extends the facilities offered by the OS 360 PL/1 (F) compiler. It enables PL/1 programs to be compiled link-edited and executed in a single job step. Results suggest that useful savings may be obtained in the time needed to run PL/1 programs. The program has three restrictions. The rules of the PL/1 language must be followed; PL/1 tasking is not supported; linkage editor control statements are not permitted.

PROGRAMMING SYSTEMS - Written in PL/1 Language; operates using OS/360.

MINIMUM SYSTEM REQUIREMENTS - The program operates on Version 4 Release 16 of the PL/1 (F) Compiler in any machine configuration that allows the compiler to operate.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360DØ11ØØ6

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/8ØØ	26	Ø1
		MT 9/8ØØ	28	Ø1
		MT 9/16ØØ	29	Ø1
OPTIONAL	none	none		none

360D-Ø1.3.ØØ2
1287 CHECK DIGIT AND NUMERIC RECONSTRUCTION MACROS

AUTHOR: B. A. Kullmann

DIRECT TECHNICAL INQUIRIES TO:
B. A. Kullmann
Strawbridge & Clothier - Programming Dept.
8th and Market Streets
Philadelphia, Pa. 19107

*** N - - Ø1.3 Ø1.7 Ø3.7 Ø6.6 4Ø.3 - - ***

DESCRIPTION - The S/360 reconstruction package is designed to calculate and insert digits which an optical scanner cannot recognize. Three facilities are included in this package. (1) To verify that a field contains all numeric data. (2) To calculate an unrecognizable digit when a field has a modulus 1Ø check digit. (3) To calculate any number of unrecognizable digits within a group of fields which are arithmetically related to each other by an Add-Subtract formula with or without sub-totals.

PROGRAMMING SYSTEMS - The two MACROS and the logic module which comprise this package were written in DOS Assembler language. They were assembled and tested using DOS Version 17 on a S/360 Model 3Ø.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 3Ø with decimal arithmetic and a console typewriter. The MACRO's should be cataloged in the source statement library and the module in the relocatable library. The module is 1662 bytes in length.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360DØ13ØØ2

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	ØØ	none
OPTIONAL	none	none		none

360D-Ø1.4.ØØ3
OPERATING SYSTEM ACCOUNTING

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
D. Jacobs
The Boeing Co., Vertol Div.
1ØØ Woodland Ave.
Plant 3-Ø1, Mail Stop P3Ø-47
Ridley Park, Pa.

*** S VDP ACT Ø5.1 Ø6.3 29.1 - - - ***

DESCRIPTION - This program was written to-

1. Determine task time of each step of job.
2. Determine wait/overhead time of job.

360D

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3. Inform operator of tape assignments by DD name.
4. Determine starting address of problem program RB.
5. Determine maximum tapes and disks used in job.
6. Print accounting information of job on SYSOUT and system residence pack.
7. Punch accounting records from disk.

Step initiator has been modified so that it accomplishes (3), (4), and (5) above. It also issues a timer macro prior to issuing the "ICTL" to the problem program. Step termination accomplishes (1) and (2) above. Job termination accomplishes (7) above.

PROGRAMMING SYSTEMS - Runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for Operating System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360DØ14ØØ3

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	ØØ	none
OPTIONAL	none	none		none

360D-Ø1.4.ØØ5
OS TRACE FOR IBM SYSTEM/360

AUTHOR: J. R. Webber

DIRECT TECHNICAL INQUIRIES TO:
J. R. Webber
IBM United Kingdom Ltd.
Newtown House, Maid Marian Way
Nottingham, England

*** N - - Ø2.5 Ø4.2 - - - - - ***

DESCRIPTION - This program will trace any user program written to run under OS. By means of a control card, the user may have the instructions printed out as they are executed showing storage areas, register contents, current condition code and the address of the instruction being traced. Before execution of a SVC Ø the CCW chain is printed and after execution the actual record read or written. The control card specifies the address range of the instructions to be printed out, how many instructions are to be printed, and allows branch-only tracing; snapshots of core may also be obtained. The user program requires no modification to run under trace control.

PROGRAMMING SYSTEMS - Requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360DØ14ØØ5

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	ØØ	none
OPTIONAL	none	none		none

360D-Ø1.4.ØØ6
DOS BACKGROUND ACCOUNTING

AUTHOR: G. E. Little

DIRECT TECHNICAL INQUIRIES TO:
G. E. Little
University of Rhode Island
Computer Lab.
Kingston, Rhode Island Ø2881

*** N - - Ø3.Ø - - - - - - ***

DESCRIPTION - This accounting package consists of modifications to Release 14 of DOS to provide elapsed wall time for background jobs. Additional information provided at job end includes the date, job start time, a job number for accounting purposes, programmers identification, and a DOS code. Optional features include a table search at job start to exclude invalid job numbers, a punched output header card, and the setting of the link option to make Compile, Load, and Go standard for background jobs. Versions of this package have been in use since Release 8 of DOS with only minor changes required when new releases become available. An MPS DOS system does not preclude the use of the package but no attempt is made to subtract increases in the wall time for background jobs caused by foreground jobs. Forty bytes are added to the DOS

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Supervisor.

PROGRAMMING SYSTEMS - Requires DCS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D014006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.4.007
S/360 OS ACCOUNTING LOG PRINT

AUTHORS: G. J. Malthy B. D. Currah

DIRECT TECHNICAL INQUIRIES TO:
G. J. Malthy
North American Life Assur. Co.
105 Adelaide St.
Toronto 1, Ontario, Canada

*** N - ALP - - - - - - - - ***

DESCRIPTION - Prints out in a readable form the contents of the OS job and step time accounting log, with totals for each day. Also writes job and step elapsed time records on tape or disk for later summarization as desired. The log records used as input are those produced via OS Release 11 when the sample accounting routine found in SYS1.SAMPLIB is incorporated in the system and when the schedulr macro is set up with the operand ACCTRTN-supplied at system generation time. The program allows usage of special dummy job cards in the regular workday job stream to report on IPL, reader opening and closing, and otherwise unlogged non OS time usages. The program will not handle log records produced under Multiprogramming with a Variable Number of Tasks, but is o.k. for single task operation and for foreground/single background operation (i.e., 2 partitions maximum).

PROGRAMMING SYSTEMS - Requires Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 or better with Decimal Feature, operating under full O/S with at least a system reader, system printer, and one disk drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D014007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.4.008
PROCK - A PROGRAM CHECK ROUTINE IN MACRO FORMAT

AUTHOR: Mr. R. G. Bayer

DIRECT TECHNICAL INQUIRIES TO:
Mr. R. G. Bayer
IBM Corp.,
2125 Biscayne Blvd.,
Miami, Fla. 33137

*** N - - - - - - - - - - ***

DESCRIPTION - PROCK is Macro which generates a comprehensive program check routine for use with the DOS STXIT Macro. When a program check occurs the job name and most of the old PSW is printed on the console typewriter. The operator has four options in replying-

1. Go to end of job without a core dump.
2. Go to end of job with a core dump.
3. Mask out Decimal Overflow and Fixed Point Overflow and continue the problem program.
4. Mask out Decimal Overflow and Fixed Point Overflow, dump the background area, and continue the problem program.

PROCK can be of significant aid in both debugging and production runs.

PROGRAMMING SYSTEMS - Written in DOS Assembler Language and operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - DOS configuration with a

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console typewriter and uses 300 bytes of core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D014008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.4.009 *M
SUPER-SCRATCH (SUPERSCR)

AUTHOR: R. D. Seawright

DIRECT TECHNICAL INQUIRIES TO:
R. D. Seawright
IBM Corp.,
Cambridge Scientific Center,
545 Technology Square,
Cambridge, Mass. 02139

*** S UCW - 01.6 00.5 - - - - - ***

DESCRIPTION - SUPERSCR is designed to scratch all user data sets from a direct access device other than those specifically requested to remain. A list of data set names is constructed and placed in either or both of two locations- (1) SYS1.PROCLIB, member equals save. (2) SYSIN DD * when SUPERSCR is executed. The list of data set names are those that the user will want permanent to the system. For statistical purposes a sequential data set named SYS1.STATLOG can be allocated into which SUPERSCR will write information concerning any purging of the direct access files. This feature is optional to the user. SUPERSCR has been tested successfully on System/360 Models 40, 50, and 65 running OS/360 PCP or MFT/I. SUPERSCR will run in the minimum OS/360 Scheduler Partition. Program execution time is negligible.

PROGRAMMING SYSTEMS - Runs under 360/OS.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D014009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.4.010 *N
SYSGEN AIDE: DIRECTORY DUMP

AUTHOR: Rita Katz

DIRECT TECHNICAL INQUIRES TO:
Rita Katz
Computer Center, Brooklyn College
Bedford Ave. & Ave. H
Brooklyn, New York 11210

*** C 1026 - 1.5 - - - - - - ***

DESCRIPTION - This program was written to simplify the job of DOS system generation. It prepares the COPYC, COPYR, and COPYS control cards needed by the CORGZ program when the DOS user wishes to copy his phases, modules, and hooks from one release onto another.

PROGRAMMING SYSTEMS - Written in Basic Assembly Language and requires 952 bytes.

MINIMUM SYSTEM REQUIREMENTS - A disk drive, a card punch and card reader, and 360 Model 25,30,40, or 50.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D014010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.4.011 *N
XEROX - COMMUNICATIONS PRODUCTS DIVISION OS/360 - MFT ACCOUNTING ROUTINES

AUTHOR: R.A. Hayes

DIRECT TECHNICAL INQUIRIES TO:
R.A. Hayes
Xerox Corporation - Xerox Square
801, Rochester, New York 14603

*** S XEC - 03.0 03.8 05.2 - - - - ***

DESCRIPTION - The purpose of the Xerox Communication Products Division Accouting Routine is to derive complete operating statistics for a system running under OS/360 MFT-II. The complete package consists of two resident SVC's, a resident task statistics table, a resident routine which accumulates I/O statistics and two routines which are included in the scheduler.

Accounting statistics are recorded on direct access by the routines without requiring any special JCL. Statistics recorded at step and job termination include accounting parameters, programmer name, job name, step name, date and time of completion of each step (or job), and elapsed time for each step (or job). Additionally, at each step termination, the elapsed time is broken down into CPU (active processing), WAIT (task wait), and IDEL (task ready but out of contention) times. Counts of I/O activity by major device classes and partition size used are also recorded on direct access. Messages are put on SYSOUT at each step termination giving vital statistics for the step. Direct access data may be retrieved by standard or customized utility programs. Reporting programs can be tailored by the installation. Routines are submitted in the form of Assembler language macros and may be altered to suit the installations need thru parameter changes. Listing comments explain all output and options in detail.

PROGRAMMING SYSTEMS - The routines are written in Assembler (F) and have been tested on both 30K and 44K schedulers on Releases 16 and 17 (MFT) of the Operating Systems.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D014011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-01.5.002
360/1620 TAPE TO COMPATIBILITY DISK RESTORE

AUTHOR: Mr. D. M. Knight

DIRECT TECHNICAL INQUIRIES TO:
Mr. D. M. Knight
Norden Div.,
United Aircraft Corp.,
Norwalk, Conn.

*** S UAN - 00.4 12.0 00.3 - - - - ***

DESCRIPTION - Restores compatibility disks from back-up tapes generated by "360/1620 compatibility disk to tape dump" 360D-01.5.003. The decks supplied are stand alone utilities and operate independently of all other software. Disks may not contain bad tracks (also true for compatibility program) unless they are not in the compatibility area.

PROGRAMMING SYSTEMS - Source language is BPS Assembler with all macros expanded. Running time is about ten minutes per disk.

MINIMUM SYSTEM REQUIREMENTS - 32K bytes of storage, one 9-track tape drive and one 2311 Disk Drive are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D015002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.5.003
360/1620 COMPATIBILITY DISK TO TAPE DUMP

AUTHOR: Mr. D. M. Knight

DIRECT TECHNICAL INQUIRIES TO:
Mr. D. M. Knight,
Norden Div.,
United Aircraft Corp.,
Norwalk, Conn.

*** S UAN - 00.3 12.0 00.4 - - - - ***

DESCRIPTION - Dumps 360/1620 compatibility disks to 9 track tapes for data and program backup. The deck supplied is a stand alone utility and requires no other software. Disk may not contain bad tracks (also holds true for compatibility) unless they are not in compatibility area.

PROGRAMMING SYSTEMS - Source language is BPS Assembler with all macros expanded. Running time is about 10 minutes per disk.

MINIMUM SYSTEM REQUIREMENTS - Program requires a 32k system with a 2311 disk drive and a 9-track tape drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D015003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.5.004 *N
OS/360 CHECKPOINT AND IPL RESTART

AUTHOR: M. Husek

DIRECT TECHNICAL INQUIRIES TO:
Ken Hapeman
121 State Street
Albany, New York

*** N - - 01.1 - - - - - - - ***

DESCRIPTION - The OS/360 IPLCHKPT module is designed to allow users who cannot permit long periods of down time, to recover quickly in event of an OS failure. The program is an Assembler language module which can be executed by itself or as a part of a critical job to create a checkpoint tape of the operating system at that particular time. In the event of an OS failure, the operator can IPL from this tape to restore the operating system and critical job to their status as of the time the tape was created. Minor changes would have to be made to accommodate different core sizes, but the program should work on any OS system. Care must be taken to create the tape at a time when all I/O is quiesed.

PROGRAMMING SYSTEMS - Written in Assembler language and tested under Release 16 of OS MFT and MVT.

MINIMUM SYSTEM REQUIREMENTS - Written in Assembler language and tested under Release 15 of OS MFT and MVT.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D015004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-01.6.002 *N
OS/360 GENERALIZED ISAM UTILITY PROGRAM

AUTHOR: William M. Ames

DIRECT TECHNICAL INQUIRIES TO:
William M. Ames
IBM Corp.,
200 E. Camperdown Way,
Greenville, S.C. 29601

*** N - - 06.5 06.8 - - - - - ***

DESCRIPTION - This generalized utility program will assist the OS/360 user in reorganizing and maintaining indexed sequential data sets. The program performs any of four functions-

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- Provides a formatted listing of records within an indexed sequential data set.
- Creates a sequential data set using an indexed sequential data set as input.
- Creates an indexed sequential data set using a sequential data set as input.
- Provides information regarding the distribution of logical records among prime data and overflow areas.

The job control and utility control card requirements for this program are consistent with those of standard OS/360 utilities.

PROGRAMMING SYSTEMS - Written in Assembler Language and runs under Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - Those Required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D016002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.6.003
INSPECT/MODIFY PROGRAM FOR SYSTEM DIRECT ACCESS DEVICE (SUPERZAP)

AUTHORS: D. M. Ludlow C. N. Still

DIRECT TECHNICAL INQUIRIES TO:
C. N. Still
IBM Corporation
D.P. Hq. Field Systems Center
Bldg. 985, Dept. H74
Poughkeepsie, New York 12603

*** N - - 00.5 067 - - - - - ***

DESCRIPTION - SUPERZAP is a programming aid designed to inspect, update, and print the contents of data sets which reside on direct access devices. Data references can be made either directly by position within a specific data record or indirectly by using an assembly listing. The main utility of SUPERZAP is its ability to automatically locate link edited load modules---implement the control functions of VERIFY, REP, DUMP, and DUMPT. Any modifications of load modules require the program to access the data set directory and set on the locally modified bit in the member SSI byte.

PROGRAMMING SYSTEMS - Runs under the IBM System/360 Operating System and utilizes the Data Management and systems facilities in refering to and altering the contents of the data set.

MINIMUM SYSTEM REQUIREMENTS - 32K OS/360 system environment where the data set records to be accessed are no greater than 3K bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, sample problem and job control cards.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D016003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.6.004
ISCTS - S/360 DOS PROGRAM TO EXTRACT INDEX SEQUENTIAL COUNTS FROM FORMAT 2 LABEL

AUTHOR: E. H. Dilley

DIRECT TECHNICAL INQUIRIES TO:
E. H. Dilley
The Hobart Manufacturing Co.,
711 Pennsylvania Ave.,
Troy, Ohio 45373

*** N - - 00.5 067 - - - - - ***

DESCRIPTION - The ISFMS (Index Sequential File Management System) maintains the following counts in the format 2 label-
- Random references to non first overflow records.
- Number of records in prime data area.
- Number of records in overflow area.
- Number of independent overflow tracks remaining.

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- Number of cylinder overflow areas full.

This program will retrieve the Format 2 labels from a 2311 ISFM file and print the counts on the 1052 Typewriter. These counts are very useful in determining when to reorganize the file, how much space to allocate to prime area and overflow area etc. Two user written macros were used. These are included if user chooses to reassemble.

PROGRAMMING SYSTEMS - Source language - 16K DCS/TOS Assembler Language (BAL).

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30, 16K or greater and 1052 Printer-Keyboard.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D016004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.6.005
VTOC4MAT

AUTHOR: M. Wapnitsky

DIRECT TECHNICAL INQUIRIES TO:
M. Wapnitsky
Software Development
Insurance Data Processing Center
80 Pine Street
New York, New York 10005

*** S IDP - 03.5 04.0 - - - - - ***

DESCRIPTION - The VTOC4MAT utility program was written in Assembly Language to produce a readable list of the VTOC (Volume Table of Contents) on any 2311 or 2314 device.

PROGRAMMING SYSTEMS - Written in Assembler language and operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - A card reader (or other suitable source of input), a printer and a 2311 or 2314 Direct Access Device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D016005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.6.006
RETRIEVAL OF REORGANIZATION STATISTICS FOR PL/I (F) INDEXED FILE USERS

AUTHOR: E. Camp

DIRECT TECHNICAL INQUIRIES TO:
B. Camp
IBM Corporation
P. O. Box 1900
Boulder, Colorado 80302

*** N - - 13.0 - - - - - - ***

DESCRIPTION - An OS/360 subroutine which retrieves statistics related to the reorganization of an Indexed Sequential File. This routine is dynamically invoked from a PL/I program via the CALL statement. The following statistics (in packed decimal form) are placed in the area designated by the PL/I call: (1) the number of index levels for the file, (2) number of records that can be placed on each overflow track, (3) number of random (direct) accesses to independent overflow area records per processing cycle, (4) number of logical data records in prime area, and (5) in overflow area(s), (6) number of tracks being used for highest level index, (7) number of partially or completely unused overflow tracks, and (8) number of full cylinder overflow area(s).

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language and runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - This routine will operate in the environment required to process an Indexed Sequential data set using PL/I. It has no configuration requirements of its own.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D016006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-01.6.007 *M
DATA LANGUAGE I

AUTHOR: Vern L. Watts

DIRECT TECHNICAL INQUIRIES TO:
Vern L. Watts
IBM Corporation
1930 Century Park West, L.A. Dev. Ctr.
Los Angeles, California 90067

*** N - - - - - - - - - - ***

DESCRIPTION - Data Language/I is a file management-data base interface that supports hierarchical segmented structures under control of Operating System/360. Data Language/I provides application independence from access methods, from physical storage organization, and from the characteristics of devices on which the application's data is stored. This independence is provided by a common source linkage program and by data base descriptions external to the application program. These external data base descriptions to describe the logical data organization of data bases to Data Language/I and make it possible to physically reorganize established data bases in a timely manner without modification to application programs. Reduction in application program maintenance should result.

PROGRAMMING SYSTEMS - Source language is Assembler Language. It will operate under PCP, MFT-II (Multiprogramming with a Fixed Number of Tasks) and supports programs written in COBOL, PL/I, and Assembler Language; and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K with Decimal Arithmetic feature and device requirements to support OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D016007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-02.0.001
DIAGNOSTIC ROUTINE

AUTHOR: J. L. Hall

DIRECT TECHNICAL INQUIRIES TO:
J. L. Hall
Mesta Machine Co.
P. O. Box 1466
Pittsburgh, Pa. 15230

*** C 3292 - 04.2 - - - - - - ***

DESCRIPTION - A diagnostic routine to track down possible errors or to check logic flow in FORTRAN programs. Because of the manner in which the track routine works, a limit had to be set as to the maximum number of statements that could be listed. This is set at 1200 lines (20 pages). When this is exceeded, the program continues execution but no more track output is given. It is suggested that control never be transfered to a "CALL TRACK" instruction. Reasons for this are that an erroneous value will be given for the value stored, and also, if the program is to be executed on a machine without track, the cards could be removed without requiring new statement numbers to be given.

PROGRAMMING SYSTEMS - Written in FORTRAN IV Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS FORTRAN with 4377 bytes of core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D020001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-02.0.003
2938 ARRAY PROCESSOR ENVIRONMENT RECORD EDIT AND PRINT

AUTHOR: T. G. Fowler

DIRECT TECHNICAL INQUIRIES TO:
D. Montogomery
IBM Corporation
SDD Department 183
1701 North Street
Endicott, New York 13764

*** N - - - - - - - - - - ***

DESCRIPTION - This program modifies the EREP (Environment Record Edit and Print) Program to identify Channel Inboard Records generated by the IBM 2938 Array Processor and to edit and print these records in a readable format for CE examination. Whenever a 2938 Model 2 is attached to S/360, Model 65 or Model 75 and running under the OS/360, a channel control check generated by the 2938 will cause a channel inboard record to be compiled by the SER Program, which includes the contents of the logout area. This record is then placed in the SYS1. LOGREC Data Set. Since the 2938 Logout bits have different significances than the normal channel logout data, it is necessary to identify this record as one generated by the 2938 for Logout Edit purposes.

PROGRAMMING SYSTEMS - Written in System/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D020003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-02.0.004 *N
INDEX SEQUENTIAL ERROR BYTE CHECK ROUTINE

AUTHOR: T.R. Cornell

DIRECT TECHNICAL INQUIRIES TO:
T.R. Cornell
1406 Washington Street
Olean, New York 14760

*** N - - 06.7 - - - - - - ***

DESCRIPTION - The Index Sequential Error Byte Check Routine will detect all error conditions which may occur while processing against or creating an index sequential file using BAL. When an error is detected the appropriate error message is displayed on the 1052 Console.

PROGRAMMING SYSTEMS - Written in DOS AL; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - This package requires the minimum requirements for DOS and a 1052 Console. A macro (ISERR) is used to link into the subroutine. This macro is coded immediately after the GET, PUT, READ, WRITE or WAITF to an index sequential file. The subroutine maintains a count of the records in the overflow area of the file when sequential processing is being done and when an end-of-file condition is encountered this count is displayed on the 1052 Console in a message, and control is returned to the programmer's end-of-file routine. The messages contain the DTFname and the error condition which occurred.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D020004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none

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OPTIONAL	none	none	none

360D-02.5.001
DYNAMIC STATUS RECORDER SYSTEM EDIT AND PRINT MODEL 30

AUTHOR: G. Slovensky

DIRECT TECHNICAL INQUIRIES TO:
G. Slovensky
IBM Corporation
Neighborhood Road
Kingston, N.Y.

*** N - - 03.6 - - - - - - ***

DESCRIPTION - This is a two-phase program for dynamically recording pertinent system environment information upon the occurrence of a hardware malfunction. The first phase, (DSR), is unique in that it is designed to be an integral part of a control program and does not require manual intervention to initiate. The SEP phase for the Model 30 can be executed on minimum core storage systems that include a 1442 or 2540 Card Reader, 1403, 1404 or 1443 Printer, and an output storage device (9 track Tape Drive, 2302, 2311, 7320 or 2321).

PROGRAMMING SYSTEMS - To facilitate inclusion into a control program, this phase is available in System/360 Basic Assembler Language source cards. Phase II (SEP) is a stand alone program that performs the editing and printing of the records constructed in Phase I. SEP is available in object deck form and consists of 144 cards.

MINIMUM SYSTEM REQUIREMENTS - This source deck, which consists of 95 cards, requires 92 bytes of core storage, and can be assembled with the Basic Assembler Program utilizing the tape option (at least one 9 track tape drive must be available for assembly).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D025001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-02.5.002
DYNAMIC STATUS RECORDER SYSTEM EDIT AND PRINT MODEL 40

AUTHOR: G. Slovensky

DIRECT TECHNICAL INQUIRIES TO:
G. Slovensky
IBM Corporation
Neighborhood Road
Kingston, N.Y.

*** N - - 03.6 - - - - - - ***

DESCRIPTION - This is a two-phase program for dynamically recording pertinent system environment information upon the occurrence of a hardware malfunction. The first phase (DSR) is unique in that it is designed to be an integral part of a control program and does not require manual intervention to initiate. To facilitate inclusion into a control program, this phase is available in System/360 Basic Assembler Language source cards.

PROGRAMMING SYSTEMS - The source deck, written in Basic Assembler Language, requires 76 bytes of core storage, and can be assembled with the Basic Assembler program utilizing the tape option (at least one 9 track tape drive must be available for assembly). Phase II (SEP) is a stand alone program that performs the editing and printing of the records constructed in Phase I. SEP is available in object deck form. The SEP phase for the Model 40 can be executed on minimum core storage systems.

MINIMUM SYSTEM REQUIREMENTS - A 1442 or 2540 Card Reader, 1403, 1404 or 1443 Printer and an output storage device (9 track tape drive, 2302, 2311, 7320 or 2321).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D025002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-02.5.003
DYNAMIC STATUS RECORDER SYSTEM EDIT AND PRINT MODEL 50

AUTHOR: G. Slovensky

DIRECT TECHNICAL INQUIRIES TO:
G. Slovensky
IBM Corporation
Neighborhood Road
Kingston, N.Y.

*** N - - 03.6 - - - - - - ***

DESCRIPTION - This is a two-phase program for dynamically recording pertinent system environment information upon the occurrence of a hardware malfunction and printing the contents upon request. The first phase (DSR) is unique in that it is designed to be an integral part of a control program and does not require manual interruption to initiate. To facilitate inclusion into a control program, this phase is available in System/360 Basic Assembler Language source cards. Deck requires 72 bytes of permanent core storage, and can be assembled with the Basic Assembler program utilizing the tape option (at least one 9 track tape drive must be available for assembly). Phase II (SEP) is a stand alone program that performs the editing and printing of the records constructed in Phase I. The SEP phase for the Model 50 can be executed on minimum core storage systems.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - A 1442 or 2540 Card Reader, 1403, 1404 or 1443 Printer, and an output storage device (9 track tape drive, 2302, 2311, 7320 or 2321).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D025003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-02.5.004
DYNAMIC STATUS RECORDING FOR DOS VERSION II WITH SYSTEM EDIT PRINT AND INITIALIZE MODELS 30, 40, 50

AUTHOR: W. F. Murray

DIRECT TECHNICAL INQUIRIES TO:
W. F. Murray
IBM Corporation
Dept. 022
Kingston, N.Y. 12401

*** N - - - - - - - - - ***

DESCRIPTION - Dynamic Status Recorder is a program which is imbedded in the DOS III Supervisor. It will, upon the occurrence of an error, cause the logout data plus a system environment record to be written to a specific cylinder on system residence for subsequent retrieval by the system edit and print program. After the record is written an exit to a user defined location is made if machine check and channel check recovery is so desired by the user. If recovery is not desired the normal SEREP/DOS III wait is entered and IPL can be executed. The inclusion of DSR into DOS III will provide a system environment record at the time of failure for subsequent analysis away from the system; this will greatly enhance the analysis of intermittent system failures by the C.E.

PROGRAMMING SYSTEMS - Requires DOS Version III.

MINIMUM SYSTEM REQUIREMENTS - Those required by DOS III. In addition, core requirements - 1350 bytes in resident supervisor. Disk requirements - 1 cylinder. First cylinder beyond the label cylinder.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D025004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-02.5.005
IBM S/360 ALTERNATE TRACK LISTER

AUTHOR: R. L. Houze

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DIRECT TECHNICAL INQUIRIES TO:
R. L. Houze
Data Systems Automation Office, Bldg.27,2
Defense Construction Supply Center
Columbus, Ohio 43215

*** N GBPU 0001A 00.4 - - - - - - ***

DESCRIPTION - The "Alternate Track Lister" is a diagnostic utility to list out the alternate track assignments of disks and data cells. DCB's used were made device independent due to MFT-2 and MVT requirements. The utility shculd execute under PCP, MFT, MFT-2, and MVT provided no IBM changes occur to EXCP macro and associated control blocks. System macros used were DCB, WTC, TIME, EXCP, and WAIT. This utility assumes that the HA and HO track records are used per IBM standards.

PROGRAMMING SYSTEMS - Designed for use under IBM S/360 Operating System (OS/360); tested using IBM S/360 Model 40 and 50 Operating system, Release #14; written using OS Assembler F.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 and above; and supports the 2311, 2314 Disk Drives and 2321 Data Cell Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D025005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.0.005 *M
ICES/360 SOURCE BASIC SYSTEM AND LANGUAGE PROCESSORS

AUTHOR: Civil Engineering Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Laboratory
Massachusetts Institute of Technology
Dept. of Civil Engineering
Cambridge, Massachusetts 02139

*** S MCE ICESD 03.2 03.3 05.0 06.7 - - - ***

DESCRIPTION - ICES/360 (Integrated Civil Engineering System for the IBM System/360) is a computer system offering general problem solving capabilities in the area of civil engineering.

The ICES system is a set of system programs used to create and run an ICES subsystem. The system programs provide the following capabilities - ICETRAN language precompiler and translator; ICES linkage editor; ICES command definition language processor; and ICES execution supervisor. The first three capabilities allow for creation and modification of an ICES subsystem. The latter provides a basis for executing such a subsystem once it has been created.

PROGRAMMING SYSTEMS - Programming language - The ICES system programs are written, for the most part, in IBM System/360 Assembly Language, although to some extent in E-level FORTRAN, and the command definition language (being itself an ICES subsystem) in ICETRAN and COL. Operating system required - ICES operates as a normal job under OS/360 and has been generated and tested using OS/360 Versions 5 through 12 on System/360 Models 40, 50, 65, and 75.

MINIMUM SYSTEM REQUIREMENTS - ICES requires a System/360 with at least 128K, two 2311 Disk Drives (or their equivalent) and input and output devices. ICES has been successfully operated using PCP MFT (option 2), ASP and HASP.

The ICES System is composed of two distribution packages. These are (a) The object package - ICES/360 Basic System and Language Processors (360D 16.2.005), and (b) this package, the source package - ICES/360 Source Basic System and Language Processors. The first package is composed of data sets and object modules and programs for the ICES Basic System and Language Processor. The second is composed of all the source programs of the ICES Basic System and Language Processor. In other words, this package has source material directly corresponding to the second package object material. The object package must be ordered by every installation wishing to run ICES. It may be used to run ICES subsystems or to create new subsystems or modify existing subsystems. Note that for each subsystem to be modified, that subsystem source package will be required along with or instead of the subsystem object package. Finally, for those installations who wish to gain a deeper understanding of how the ICES Basic System and/or Language Processors work internally or who may wish to modify this or reproduce it in some way, this distribution, the ICES/360 Source Basic System and Language Processor package is required. It contains (a) all the ICES source programs corresponding to the object programs

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provided in the ICES/360 Basic System and Language Processors distribution, (b) detailed documentation for each of the over 300 system programs, (c) flowcharts for each of these programs, and (d) an ICES System: Internal Logic Manual, which explains how the system programs work together to provide the ICES capabilities under OS/360. The system programs include a set for each language processor: ICETRAN translation, ICES Linkage Editor, Command Definition Language, as well as a set for the ICES execution system. The source program listings are found on the machine readable portion (tape) of this release. The ICES System: Internal Logic Manual, ICES System: Program Documentation, and ICES System: Program Flowcharts are found in the hard copy portion of this release.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.0.006 *M
CHECKPOINT/RESTART/RECREATE FOR OS/360 MFT II

AUTHOR: J. N. Berry

DIRECT TECHNICAL INQUIRIES TO:
J. N. Berry
IBM Corporation
555 Madison Avenue
New York, New York 10022

*** N - - - - - - - - - - ***

DESCRIPTION - Checkpoint/Restart/Recreate is a set of Assembly Language modules which runs under Operating System, MFT II, and has been integrated with releases 15.2 and 16. Primarily a tape-oriented checkpoint, it takes a checkpoint after the standard header labels of each reel of the data sets being checkpointed. At restart, the operator may re-assign devices. The restart program then issues mount messages, repositions all tape files, restores core and job queue information, and returns to the problem program. The recreate facility allows from 1 to 8 reels core and job queue information, and returns to the problem program. The recreate facility allows from 1 to 8 reels of a file tc be reproduced, leaving the rest of that file and all other files intact. Checkpoints, restarts and recreates are essentially transparent to the problem program. The correction incorporated in this version adds an additional user SVC which is necessary in order to use the program with Release 15/16 of OS.
the program with Release 15/16 of OS.

PROGRAMMING SYSTEMS - Programming language is Assembler Language. Operating system required is OS/360 Release 15 and up.

MINIMUM SYSTEM REQUIREMENTS - The program executes primarily out of the SVC transient area and requires not more than 1000 bytes of problem program core. It may be run on any hardware configuration under OS/MFT II and assembled under any OS system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code, and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-03.0.007
S/360 MOD 44 MULTIPROGRAMMING SYSTEM

AUTHOR: J. K. Alexiou

DIRECT TECHNICAL INQUIRIES TO:
J. K. Alexiou
IBM Corporation
11141 Georgia Avenue
Wheaton, Md. 20902

*** N - - 050 160 170 230 - - - ***

DESCRIPTION - This program supports external interrupt

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under DAMPS Version 2 (360A-CI-20X), eliminating the need for the Priority Interrupt special feature. Consequently, DAMPS will execute on a standard S/360 or a Model 44 with special features. The resulting system supports two independent, storage protected partitions. The background partition supports a standard Mod 44 P/S job stream. The foreground partition assigns program tasks to six levels of external interrupts, the Interrupt Key, or dynamically schedules them for multiprogrammed execution while external interrupts are inactive. For on-line scientific application, DAMPS supports a real-time interface for OEM devices. With the exception that the Priority Interrupt, External Interrupt and Memory Protection special features are not required.

PROGRAMMING SYSTEMS - Source language is BAL.

MINIMUM SYSTEM REQUIREMENTS - Same as for DAMPS, Version 2.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.0.008
DOS IOCS LOGIC MODULE SOURCE STATEMENT GENERATOR

AUTHOR: J. H. Coelho

DIRECT TECHNICAL INQUIRIES TO:
J. H. Coelho
IBM Corporation
1049 Asylum Ave.
Hartford, Conn. 06105

*** N - - 036 - - - - - - ***

DESCRIPTION - Given the DOS generated standard IOCS logic module name (e.g. IJCFCIZO), this program will produce, on SYSPCH and SYSLST, the DOS job control cards and source statements (macro keywords and operands), in the proper sequence, to assemble the module. The program is self-relocating. Input is from SYSLOG or SYSIPT, where SYSIPT is a card reader, disk or tape drive supported by DOS. All module names submitted are checked for validity, and due to the ability to produce a complete job stream of many assemblies in one run, the program could significantly reduce desk time and keypunching at system generation time.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language, and will run on any system capable of supporting DOS.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.0.010 *N
STENO TO ENGLISH TRANSLATION

AUTHOR: Office of Computer Services

DIRECT TECHNICAL INQUIRIES TO:
W. Eisner
Office of Computer Services
Central Intelligence Agency
Washington, D.C.

*** S CAD - 06.0 08.0 - - - - - ***

DESCRIPTION - The S/360 Steno to English program is designed to translate Stenographic input into English output. The output takes form in all upper case with an @ sign representing initial capitalization.

PROGRAMMING SYSTEMS - Written in ALC and has been compiled and tested using OS Version 17 on a S/360 Model 40, 50 and 65 system.

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MINIMUM SYSTEM REQUIREMENTS - Steno program should run on any S/360 Model 30 and up. An on-line printer, 132 print positions, console typewriter, and one tape and 2314 Disk Drive are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.0.012 *N
PARS CONTROL (ACP)

AUTHOR: J.E. Siwiec

DIRECT TECHNICAL INQUIRIES TO:
J.E. Siwiec
IBM Corp., DPD
112 East Post Road
White Plains, New York 10602

*** N - - - - - - - - - - ***

DESCRIPTION - This BAL program provides a high throughput, multi-programming, real-time control for up to 3000 remote 2915 or 1977 terminals. It includes Incoming and Outgoing message control, dynamic core and file allocation as well as component and system error routines.

PROGRAMMING SYSTEMS - Written in Basic Assembler language.

MINIMUM SYSTEM REQUIREMENTS - Runs on System/360 Models 50 or 65 with 256K core, 2314 Disk and Tape Drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	04
OPTIONAL	none	none		none

360D-03.0.014 *N
MULTIPROGRAMMING SYSTEM (MPS)

AUTHOR: Dr. M.W. Sachs

DIRECT TECHNICAL INQUIRIES TO:
Dr. M.W. Sachs
Nuclear Structure Laboratory
Yale University
New Haven, Connecticut

*** S YU - 03.2 05.2 06.8 - - - - ***

DESCRIPTION - MPS is a multiprogrammed operating system for the 360 Model 44. The system, designed for real time data acquisition, supports multiple users in a fully protected environment. Features of the system include dynamic storage allocation, re-entrant supervisor, FORTRAN compiler, loader editor job control processor, virtual device utilities, intertask communication facilities and operator control programs.

PROGRAMMING SYSTEMS - 360/44 Programming System.

MINIMUM SYSTEM REQUIREMENTS - The system requires at least 64K bytes of core, Floating Point Feature, storage protection, reader, punch, printer, one SDSD, one other random access drive and one tape for system maintenance.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D030014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-03.1.009
MACRO PROGRAMMING METHOD FOR SYSTEM/360

AUTHOR: S. D. Stutz

DIRECT TECHNICAL INQUIRIES TO:
S. D. Stutz
IBM Corporation
Box 31
Boise, Idaho

*** N - - - - - - - - - ***

DESCRIPTION - Existing as a part of the OS/360 Assembly Language structure is the most powerful macro instruction set developed to date by IBM programming systems staffs. As the philosophy of the Operating System/360 revolves about the macro capability, it seems logical to extend, tailor, and create facilities which would give an installation improved performance through the development and use of macro statements. It is possible to achieve greater coding throughput and installation efficiency when, after an installations testing and programming problems are analyzed, both general and unique macro statements are developed for and applied to these problems. The routines included in this package have been found to be of great assistance to the installation programming staff in their use of Assembly Language. They permit the System/360 Assembly Language material be organized to allow flexibility, provide coded documentation, reduce program coding time, reduce the testing phase, maintain installation standards, shorten the training phase, and easily maintain the program library.

PROGRAMMING SYSTEMS - Written in OS/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - That required for OS/360 Assembly Language.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D031009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.1.012
DOS/360 PRIVATE LIBRARY SYSTEM LIBRARY SYSTEM - VERSION III

AUTHOR: W. R. Maple

DIRECT TECHNICAL INQUIRIES TO:
W. R. Maple
IBM Corporation
675 W. Market St.
Lima, Ohio 45802

*** N - - - - - - - - - ***

DESCRIPTION - The Private Library System Version III is a collection of programs that enable a DOS Version III user tc maintain private core image libraries on any number of combination of DOS supported DASD volumes. In addition, the system can make programs appear to be self-relocating regardless of the language used to create the program. This system is compatible with, and is a replacement for the previously available private library system and contains many improvements.

PROGRAMMING SYSTEMS - Written in Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - A 32K System/360 that has the Decimal feature. SYSIN and SYSOUT cannot be disk and DASD protect cannot be used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D031012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.1.013 *M
S/360 ASSEMBLER FOR 1130 AND 1800 ASSEMBLY LANGUAGE PROGRAMS

AUTHOR: Mrs. K. L. Utley

CONTINUED FROM PRIOR COLUMN

DIRECT TECHNICAL INQUIRIES TO:
Mrs. K. L. Utley
IBM Corporation
Dept. 779
700 Banyan Trail
Boca Raton, Florida 33432

*** N - - - - - - - - - ***

DESCRIPTION - This program assembles 1130 and 1800 Assembly Language programs. It accepts an extended set of source statements, including special 1130 Disk Monitor, 1130/2250 Graphics, 1800 Time-Sharing Executive, and 1800 Multiprogramming Executive statements. In addition to producing an assembly listing and error messages, the program produces as optional output an 1130/1800 object deck, instruction times, and cross reference listings.

PROGRAMMING SYSTEMS - Programming language - S/360 Operating System (OS) Assembly Language. Operating system required is OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 having the basic instruction set and at least 128K core storage bytes. The program I/O units can be varied by DD statements; with the standard units, the program accepts card input, punches column binary output, prints list data, and requires 3 work files on disk or magnetic tape storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D031013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-03.1.014 *M
FAST ASSEMBLER - INTERPRETER FOR SYSTEM/360 ASSEMBLER LANGUAGE PROGRAMS (VERSION 1)

AUTHOR: J.R. Ehrman

DIRECT TECHNICAL INQUIRIES TO:
J.R. Ehrman
Stanford Linear Accelerator Center
Stanford, California 94305

*** S SLA - 03.3 - - - - - - ***

DESCRIPTION - The Fast Single-Pass Assembler-Interpreter System provides a processor for the Operating System/360 Assembler Language with the following features: (1) almost full language compability with the OS Assembler Language, (2) extremely high assembly rate (3) an interpreter for the System/360 instruction set, (4) extensive and detailed assembly-time and execution-time diagnostic messages and facilities, (5) simple macro-like instructions for diagnostic and input/output operations, (6) an extended syntax for DC and DS statements, and (7) a submonitor which permits batched assemblies and executions. The few restrictions on the language derive from the one-pass load-and-go nature of the Assembler. A guide to the use of the system is included with the distribution tape.

PROGRAMMING SYSTEMS - All I/O uses QSAM, and the system is programmed entirely in OS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The system is re-entrant and requires about 35K bytes plus a work space whose size is an invocation parameter, for most student programs an additional 10K is ample.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D031014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.2.004
PET - PRE-PROCESSOR OF ENCODED TABLES

AUTHOR: K. J. Coulter

CONTINUED FROM PRIOR PAGE

DIRECT TECHNICAL INQUIRIES TO:
K. J. Coulter
Bell Telephone Co. of Canada
620 Belmont, R1310
Montreal, Quebec, Canada

*** G - - 12.2 03.6 - - - - - ***

DESCRIPTION - PET is a decision table translator. The source language is a combination of PL/I and PET verbs. Through rule sorting and the cross-linking of duplicate action strings, efficient structuring of the input tables logic produces optimized output program code. A complete error check plus a table update facility permits debugging at the logic level. Seven phases of PET pass against table held in internal array. Pet can handle up to 30 rules and 50 conditions and/or actions per table, plus initialization and comment cards. Only limited entry tables having no "else" rules nor "numbered" actions are translatable by PET. Logical tables may be grouped and cross referenced to create procedures. 67K partition system is required.

PROGRAMMING SYSTEMS - Written in PL/I level "F" and has been split into 5 segments to save core.

MINIMUM SYSTEM REQUIREMENTS - PET can be executed on any IBM S/360 configuration which can handle the PL/I Compiler, with a minimum of 128K storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.2.006
HOUSTON GENERAL ONESTEP MONITOR

AUTHOR: J. K. Boggs, Jr.

DIRECT TECHNICAL INQUIRIES TO:
J. K. Boggs, Jr.
IBM Corporation
6900 Fannin Street
Houston, Texas 77025

*** N - - 05.1 06.8 07.0 - - - - ***

DESCRIPTION - The objective of this program is to provide a generalized monitor program under OS/360 to allow compile, compile-linkedit, and compile-linkedit-go to be executed in only one job step. This will prove beneficial in speeding up these processes because the job scheduler need be brought in only once for each situation resulting in less OS/360 overhead. Execution of the monitor is accomplished through normal JCL and it, in turn, causes invocation of the proper compiler, linkage editor, and the program to be tested by use of the LINK macro. The program is patterned after the FORTRAN H onestep Monitor which is available in the IBM Program Library (360D-03.2.003).

PROGRAMMING SYSTEMS - This program extends the capabilities of the above to include support for all compilers running under OS, as of Release 13, except for ALGOL.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.2.007 *M
BASIC COMPILER UNDER RAX

AUTHOR: R. C. Wheeler

DIRECT TECHNICAL INQUIRIES TO:
R. C. Wheeler
Airborne Instruments Laboratory
Walt Whitman Road
Melville, N.Y. 11746

*** N - - - - - - - - - ***

CONTINUED FROM PRIOR COLUMN

DESCRIPTION - This program is submitted as a Type IV program to the IBM Library to provide the customer with a facility to use the BASIC compiler under RAX. Various modifications to RAX are also included for BASIC support. BASIC will provide all the language capabilities as presently available in the Dartmouth BASIC language specifications. The addition of a basic command calls the BASIC compiler. The RAX modification in no way affects any of the present RAX capabilities. The terminal control language of RAX provides excellent support for the BASIC user. All RAX facilities and commands will now support BASIC in addition to FORTRAN and Basic Assembler Language. This is Version 2 and obsoletes any previous version.

PROGRAMMING SYSTEMS - Basic Assembler Language is used and will run on an extended RAX configuration. Some library routines are written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Those needed for a minimum RAX configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.2.008
KINETIC SIMULATION LANGUAGE FOR CHEMISTRY AND BIOCHEMISTRY

AUTHOR: L. Peterson

DIRECT TECHNICAL INQUIRIES TO:
D. Garfinkel
University of Pennsylvania
Dept. of Biophysics and Physical Biochemistry
Johnson Research Foundation
Philadelphia, Pennsylvania 19104

*** S CUP - 17.3 17.5 43.2 - - - - ***

DESCRIPTION - This is a problem-oriented language to permit the (continuous) simulation of the kinetic behavior of complex chemical or biochemical systems. The language is that of the chemist; the program translates his chemical reactions into differential equations, solves them by first-order numerical methods starting from specified initial conditions, and edits the results. Provision is made for the user to add his own subroutines at appropriate points.

PROGRAMMING SYSTEMS - Written in FORTRAN IV, batch processor and card-input oriented.

MINIMUM SYSTEM REQUIREMENTS - Those required for S/360 Model 65, double-precision computation with FORTRAN level G or above.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.2.009 *M
MODIFIED DOS FORTRAN COMPILER

AUTHOR: H. Givner

DIRECT TECHNICAL INQUIRIES TO:
H. Givner
Brooklyn College
Computer Center
Brooklyn, New York 11210

*** C 1026 - 12.2 - - - - - - ***

DESCRIPTION - This compiler is a modification of IBM S/360 DOS FORTRAN IV 360N-FO-451 change level 3-1. In addition to recognizing all the FORTRAN source statements described in C28-6629, this compiler will recognize the FORTRAN II read, punch and print statements, and will generate code referencing data sets 1, 2, and 3 respectively, thus permitting compilation of FORTRAN II source programs without having to convert their I/O statements into the FORTRAN IV read and write statements. Source statements will be

CONTINUED FROM PRIOR PAGE

translated from BCD to EBCDIC as they are read, if the user chooses this option, so that source programs punched on an 026 will list properly. Information is provided in the write-up so that the user may apply the modifications to future releases by IBM to their compiler.

PROGRAMMING SYSTEMS - Requires DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by the Disk Operating System. Main storage requirements - 10K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Assembly Listings.

ORDERING INFORMATION: PROGRAM NUMBER 360D032009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01

360D-03.2.010
THE SYSTEM/360 JOVIAL COMPILER

AUTHOR: G. D. West

DIRECT TECHNICAL INQUIRIES TO:
C. A. Roh
IBM Corporation
1120 Connecticut Ave., N.W.
Washington, D. C.

*** N - - 12.2 - - - - - - ***

DESCRIPTION - The JOVIAL Compiler provides a JOVIAL language processing capability within the environment of the IBM System/360 Operating System. The source language recognized is JOVIAL (J3), adapted for IBM System/360. JOVIAL is used in command and control applications. The compiler is coded primarily in a special language designed specifically for systems programming applications.

PROGRAMMING SYSTEMS - Runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - System/360, Model H40 with the Standard Instruction Set and the Floating-Point feature. A minimum of two 2311 IBM Disk Storage Drives (or comparable storage) is required. One IBM 2400-series Magnetic Tape Unit (9-track), and an IBM 2311 Disk Storage Drive are required for program installation and maintenance. The compiler requires 225K bytes of dynamic main storage. Secondary storage space is required for the following data sets: system residence, system input, five intermediate storage, print output, punch output, object module.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/1600	29	02
		MT 9/800	28	02
OPTIONAL	none	none		none

360D-03.2.011
OS/360 PL360 COMPILER

AUTHOR: N. Wirth J. W. Wells, Jr.
E. Satterthwaite, Jr.

DIRECT TECHNICAL INQUIRIES TO:
E. Satterthwaite, Jr.
Computer Science Dept.
Standford University
Standford, Californai 94305

*** S STU PLA 03.1 - - - - - - ***

DESCRIPTION - PL360 is a programming language for the S/360 computers which includes many facilities of Symbolic Assembly languages but displays an ALGOL-like syntax. This program translates PL360 source statements to sequences of object modules in standard OS/360 format. Precedence syntactic analysis techniques are used to provide fast, one-pass translation. Most of the compiler is written in PL360. The operating system interface is localized in a single control section.

PROGRAMMING SYSTEMS - Written in OS Assembler (F); and operates using OS/360 and has been tested using Release

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11 and Release 13 MFT.

MINIMUM SYSTEM REQUIREMENTS - The interface supplied requires a 128K machine, instructions are included for developing alternate interfaces. Requirements are then 57K of storage, Scientific Instruction Set, and equivalents of a reader, printer, punch, and linking loader that accepts object modules in standard format.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.2.013 *M
BASIC COMPILER UNDER TSS/360

AUTHOR: C.E. Bury

DIRECT TECHNICAL INQUIRIES TO:
C.E. Bury
IBM, Dept #708
112 East Post Road
White Plains, N.Y. 10601

*** N - - 40.2 41.7 45.1 - - - - ***

DESCRIPTION - The TSS/360 BASIC Language Compile program makes the BASIC language and the matrix extension to the BASIC language available to TSS users. The compiler and the generated code operate within a minimum TSS operating environment. The compiler and the generated code will operate in TSS Release 4.0, twenty-four or 32-bit mode, foreground or background. Executable code is generated in virtual memory only. The user creates and maintains source program data sets with TSS facilities. TSS commands are used to execute the compiler. BASIC input and output data sets are TSS compatible.

MINIMUM SYSTEM REQUIREMENTS - Same as those for TSS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code, sample problem, job libraries and executable date sets.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-03.2.014 *M
THE SIMSCRIPT II PROGRAMMING LANGUAGE

AUTHOR: P. J. Kiviat

DIRECT TECHNICAL INQUIRIES TO:
P. J. Kiviat
Simulation Associates Inc.
1263 Westward Blvd.
Lost Angeles, Calif. 90024

*** S RS - 6.8 11.0 13.5 15.1 - - - ***

DESCRIPTION - The SIMSCRIPT II compiler translates source language inputs into assembly programs which are assembled by an OS multiple-assembler into link-editable modules.

PROGRAMMING SYSTEMS - Written in SIMSCRIPT II and has been compiled and tested using OS Version 15/16 on a S/360 Model 65. It will run under MVT, MFT or PCP. The program should be stored in the user's load library and called out later by the compile procedures.

MINIMUM SYSTEM REQUIREMENTS - Compilation requires core storage of at least 150K bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032014

PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT

CONTINUED FROM PRIOR PAGE

BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-03.2.015 *N

THE XPL COMPILER GENERATOR SYSTEM

AUTHORS: W.M. McKeeman J.J. Horning
D. B. Wortman

DIRECT TECHNICAL INQUIRIES:
Prof. W.M. McKeeman
Information and Computer Science
University of California
Santa Cruz, California

*** S STU XPLS0 12.2 - - - - - - ***

DESCRIPTION - The XPL System is a complete compiler generator, designed to facilitate the production of efficient SYNTAX-directed compilers for the S/360. The system consists of a dialect of PL/I called XPL designed to be convenient for writing translators; a compiler (XCOM) from XPL into S/360 Machines language; a small OS/360 Assembly language submonitor which provides the interface between XPL programs and OS/360; a program (ANALYZER) which builds parsing decision tables directly from BNF grammars; and a table driven parsing algorithm embedded in a proto-compiler (SKELETON); and several utility programs to aid in using the system under OS/360. All major components of the system except a small Assembly-Language submonitor are written in XPL and compiled by XCOM. The system may be adapted to run under operating systems other than OS/360 by writing a new version of the submonitor.

PROGRAMMING SYSTEMS - Written in XPL and compiled by XCOM. The XPL System was developed tc run under OS/360 Release 11 and 13 MFT.

MINIMUM SYSTEM REQUIREMENTS - It will run under OS/360 on any S/360 with the Universal Instruction Set, direct access storage (2311, 2314 or 2321), and at least 128K bytes of storage (although more storage enhances system performance). The system as distributed assumes 2311 Disks and will run unchanged on 2314 Disks. Programs and instructions are provided for adapting the system to work with other than 2311 Disks.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D032015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.3.003
IBM SYSTEM/360 ADVANCED CARD EDITING PROGRAM

AUTHOR: L. H. Vaughan

DIRECT TECHNICAL INQUIRIES TO:
L. H. Vaughan
69 Margaret Road
Newton, Massachusetts 02161

*** N - ACEP1 00.0 06.0 06.6 - - - - ***

DESCRIPTION - The Advanced Card Editing Program (ACEP) supports the following functions: Reproducing - any fields to any fields; two entirely independent punching formats offering increased flexibility have been included; emitting of constant information in both formats. Gangpunching (interspersed) - any fields in the master card to any fields in the detail card; several options are available to handle master card reproduction. Byte Manipulation alteration of zone and numeric portions of bytes by constants over any number of columns; transfer of zone and numeric information from input columns to output columns. Numbering any field in the output card in any of three formats zoned, or packed decimal, or fixed point binary; any signed or unsigned starting value and increment.

A special increment feature has been included to facilitate the numbering of master cards followed by a variable number of detail cards. Counting- any number of cards may be punched for each card read. The number of cards to be punched may be specified by a constant or it may be read from interspersed count control cards. The counted cards may be independently numbered in a manner similar to that described under numbering. The various functions may be used in any combination, ACEP includes complete error diagnostics and is self-optimizing. There are no restrictions on the number of fields which may be included.

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Since the entire generating program is always resident in core storage, one ACEP job after another may be loaded and executed. ACEP does not punch an object deck.

PROGRAMMING SYSTEMS - ACEP will run under BPS, BOS, TOS, or DOS control.

MINIMUM SYSTEM REQUIREMENTS - 8K, Standard Instruction Set, one 1403 or 1404 Printer for diagnostics, one 2540 Reader for input, one 2540 or 2520 Punch for output.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.3.004
PL/I FORMAC INTERPRETER

AUTHORS: R.G. Tobey J.J. Baker J. Lipson
P. Marks K.E. Victor J. Xenakis
R.J. Crews S. Haflich

DIRECT TECHNICAL INQUIRIES TO:
John Xenakis
IBM Corporation
Boston Programming Center
545 Technology Square
Cambridge, Massachusetts 02139

*** N - - - - - - - - - - ***

DESCRIPTION - The PL/I-FORMAC interpreter is an extension of the OS/360 PL/I FORTRAN Compiler. It consists of two modules of assembled routines, each module having about 70K bytes, which are added to a Systems Subroutine Library. FORMAC provides for the symbolic manipulation of mathematical expressions; e.g., the expression Sin(x) can be differentiated, resulting in the expression Cos(x). Expressions can contain variables, user-defined functions, constants to 2295 digits, and symbolic constants representing PI, E and I, as well as functions such as SIN, COS, EXP, etc. Expressions can be differentiated, evaluated, replaced, compared, and parsed. Since FORMAC is embedded in PL/I, the facilities of PL/I are available for program structure, loop control, I/O, etc. FORMAC can be used to obtain symbolic solutions in problem areas which heretofore could only be approached numerically.

PROGRAMMING SYSTEMS - Written in PL/I and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.3.005
IBM 1440 OBJECT DECK SIMULATOR ON IBM 1401 OR SYSTEM/360

AUTHOR: J. G. Vonjess

DIRECT TECHNICAL INQUIRIES TO:
J. G. Vonjess
IBM Corporation
400 Wyman Street
Waltham, Massachusetts 02154

*** N - JVJ50 11.2 11.3 - - - - - ***

DESCRIPTION - This program converts 1440/1442 type programs to 1401/1402 programs from existing object decks. It requires 1401 Hardware Compatibility on the S/360 even though the original system was a 1440/1442. If the original 1440 deck utilized punch update instructions, the S/360 2540 will require Punch-Feed-Read special feature.

PROGRAMMING SYSTEMS - Written in Autocoder on Disk (1401-AD-000).

MINIMUM SYSTEM REQUIREMENTS - S/360 with 1401 Compatibility Feature.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D033005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-03.3.006 *M
PRE-ACCAP AND POST-ACCAP EDIT

AUTHOR: B. A. Acey T. M. Fecenko

DIRECT TECHNICAL INQUIRIES TO:
T. M. Fecenko
Warnaco Inc.
Computer Development
Bridgeport, Connecticut 06602

*** N - - 03.6 12.3 - - - - - ***

DESCRIPTION - PRE-ACCAP edits the Autocoder source deck modifying source instructions to enable creation of instructions that will be converted by ACCAP. POST-ACCAP edits ACCAP output deck converting many instructions not converted by ACCAP. Statements which cannot be converted are flagged as programmer notification.

PROGRAMMING SYSTEMS - Written in source - COBOL. DOS is required. Subroutines called by generated instructions (CONVIT and DATAFIX) are written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 65K, 1401-N1 Printer, 2402-002 Tape Drive (2 units), 1052 Console, 2540 Card Read-Punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.3.007
APL/360

AUTHOR: L. M. Breed R. H. Lathwell

DIRECT TECHNICAL INQUIRIES TO:
L. M. Breed
IBM Corporation
T. J. Watson Research Center
Box 218
Yorktown Heights, New York

*** N - - - - - - - - - ***

DESCRIPTION - APL/360 is a conversational time-sharing system based on a mathematical programming language first developed by K. E. Iverson. The language is concise and has a simple syntax. It has a large set of primitive operations which work directly on arrays. The implementation provides a simple immediate-execution mode and a convenient program definition facility. It has fast response, and uses succinct diagnostic messages. It provides the ability to save work between sessions, to create programming packages, and to exchange programs and data between users. Uses of the system include mathematical and statistical calculation, symbol manipulation, and general data processing. It has been used extensively in computer-related instruction, and in the design of hardware and software.

PROGRAMMING SYSTEMS - Written in Assembly Language, incorporates a modified DOS III, and allows standard DOS background operation.

MINIMUM SYSTEM REQUIREMENTS - 256K storage, Universal Instruction Set, a 2314 or three 2311's, one 2702 or 2703, and 2741 or 1050 Terminals. Additional storage, disks, and transmission controls are supported. A typical Model 50 configuration supports 60 terminals.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE -

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Option 1 - Disk Initialization, Disk Restore, and APL/360 programs for the 2311 Disk Drive user, and is specified by using Program Number Extension OPT1.

Option 2 - Disk Initialization, Disk Restore, and APL/360 programs for the 2314 Disk Drive user, and is specified by using Program Number Extension OPT2.

Option 3 - APL/360 Starter Library for 2311 and 2314 Disk Drive users, and is specified by using Program Number Extension OPT3. (2314 users should order Option 3 only on 9-track 800 bpi or 9-track 1600 bpi magnetic tapes).

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	OPT1	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
	OPT2	MT 9/800	28	02
		MT 9/1600	29	02
	OPT3	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-03.3.009
1404 IOCS MACROS FOR DOS/TOS

AUTHOR: J. J. Hughes

DIRECT TECHNICAL INQUIRIES TO:
J. J. Hughes
IBM Corporation
2125 Biscayne Boulevard
Miami, Florida 33137

*** N - - 03.7 03.8 - - - - - ***

DESCRIPTION - The 1404 IOCS macros are a series of six macros. They provide the user with logical IOCS capability for the 1404 using cut-card forms. The macros support only one 1404 per program but may be run in more than one partition. They have been tested under Release 18 of DOS and should be compatible with future releases.

PROGRAMMING SYSTEMS - Written in DOS/TOS Assembler Language. They have been tested under Release 18 of DOS and should be compatible with future releases.

MINIMUM SYSTEM REQUIREMENTS - Those required by the operating system, and a 1404 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.3.010
SNAP PROCESSOR (PROTOTYPE)

AUTHORS: W. M. Ruhsam M. P. Barnett

DIRECT TECHNICAL INQUIRIES TO:
M. P. Barnett
School of Library Service
Columbia University
New York, New York 10027

*** S BWY PIET0 03.6 06.6 06.7 - - - - ***

DESCRIPTION - The SNAP processor executes procedures written in the SNAP language a "basic English" for librarians, educators, publishers and others to instruct the computer to perform mechanical test processing. (See M. P. Barnett and W. M. Ruhsam. IEEE Trans. EWS. Vol. EWS-11,2,45,1968; M. P. Barnett. Computer Programming in English. Harcourt, Brace & World, May 1969). When compiled it consists of a root segment of 56K bytes, the translator segment of 45K bytes (that converts SNAP procedures into the numerical SNAPIC code) and the interpreter segment of 48K bytes that can be overlayed with the translator. SNAP instructions to punch cards and paper tape, to read and write magnetic tape and direct access devices, and to punch paper tape can be used in SNAP procedures that are run on equipment with appropriate units. The compiled processor can be

CONTINUED FROM PRIOR PAGE

stored in a language library and used conveniently under OS/360. It has been used extensively for class exercises at Columbia University.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - 128K core storage, card reader, line printer and 1 tape drive (or an equivalent drum or disc).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code, test and demo job stream.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.3.011 *N
COMIT/360

AUTHOR: D. Ritchie

DIRECT TECHNICAL INQUIRIES TO:
H.B. Burner
Computing Center
Washington State University
Pullman, Washington 99163

*** S UY - 06.6 - - - - - - ***

DESCRIPTION - COMIT/360 is a conversion of COMIT II distributed through the Institute for Computer Research, University of Chicago. It provides the string manipulation and list processing facilities of COMIT for users of System/360. For a complete documentation of COMIT II, contact the Institute of Computer Research, University of Chicago.

PROGRAMMING SYSTEMS - Written in Assembler language and has been compiled and tested using OS Release 14 on a System/360 Model 67.

MINIMUM SYSTEM REQUIREMENTS - Requires a Commercial or Universal Instruction Set (Decimal feature) and will require reassembling on a System/360 with less than 256K bytes of storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.3.012 *N
SPEAKEASY

AUTHORS: S. Cohen C.B. Vincent

DIRECT TECHNICAL INQUIRIES TO:
S. Cohen
Physics Division
Argonne National Laboratory
Argonne, Illinois 60439

*** N - - 45.0 - - - - - - ***

DESCRIPTION - SPEAKEASY is a language designed for exploratory calculations in the physical sciences. It is easy to learn and use, since its vocabulary resembles that of scientific mathematics. Operations on entire structured objects (such as matrices, vectors and one and two dimensional arrays) can be specified by simple arithmetic expressions, in which indices need not appear. Matrix algebra, operations in differential and integral calculus and a large number of special purpose operators are an integral part of the language. These built-in features allow problems to be formulated quickly, naturally and very concisely. The close resemblance of SPEAKEASY to ordinary scientific notation facilitates error-free programming. Input and output of information has been carefully oriented towards the needs of a casual computer user and includes free-field input and tabular and graphical forms of output.

An interpretive version of the SPEAKEASY processor is

CONTINUED FROM PRIOR COLUMN

presented here. In this version, graphical output may be obtained on a Model 780 CALCOMP plotter.

FEATURES:

- The language is user-oriented. It is easily understoood and used by physical scientists.
- Context-oriented operations provide simplicity of structure in user programs.
- Operations are performed on structured objects. Programming loops involving specific elements of objects are for the most part eliminated.
- Dimensions for defined objects may vary dynamically during execution. Most dimensions are assigned implicitly.
- Elements of objects may be referenced either individually using scalar indices or in selected sets using structured indices.
- Calculations can be carried out with real or complex numbers. Execution time commands control the domain of calculations.
- Input is free field and tolerant of many types of user errors.
- Printed output is highly readable. Each printed object is identified by its user-selected name. The structure of the object is included in the printed output.
- Extensive diagnostic facilities are provided. Explicit messages are printed for syntax errors. Execution errors are clearly diagnosed and pertinent information is printed.
- Subprograms may be written in SPEAKEASY. They may be called for at a later time. Subprograms may call other subprograms.
- User written FORTRAN subprograms may be linked to the processor to add special purpose operations to the language.

PROGRAMMING SYSTEMS - Written in FORTRAN Level 4 H.

MINIMUM SYSTEM REQUIREMENTS - Runs under OS and needs 270K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D033012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.4.002
FORTRAN CONSOLE PROGRAMMING SYSTEM ICPS

AUTHOR: R. G. Loomis W. H. Dodrill
D. Tanner

DIRECT TECHNICAL INQUIRIES TO:
F. Zederbaum
IBM Corporation
590 Madison Avenue
New York, New York 10022

*** N - - 00.6 06.6 08.7 - - - - ***

DESCRIPTION - The program provides a set of subroutines for the generation of image definition arrays and their transformation into display strings in the buffer of the IBM 2250, with selective control over the image processing provided by the logic of the FORTRAN program. The generality of these subroutines together with the versatility of the FORTRAN Language provides great flexibility in the design of programs for image manipulation at the console according to the requirements of the particular problem. The CPS system tape embodies all the features of FORTRAN IV BPS, Level D, tape 16K, and supports a single 2250 (Model 1) Display Console, which must be equipped with 4K or 8K buffer, the Character Generator, and the Absolute Vector feature.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - The system will run on any System/360 Model 30 or higher, having 64K or more, equipped with 1052 Terminal, card reader-punch, either 2540 or 1442, 1403 Printer and four tape units. Optional features supported are the light pen, the function keys and the indicator lights.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Reference Tape and is specified by using Program Number Extension LIST. Autochart Tape and is specified by using Program Number Extension FLOW.

ORDERING INFORMATION: PROGRAM NUMBER 360D034002

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	LIST	MT 9/800	28	01
		MT 9/1600	29	01
	FLOW	MT 7/800	24	01
		MT 7/556	22	01

360D-03.4.007
SUBROUTINE OBJFMT

AUTHOR: E. M. Hamilton

DIRECT TECHNICAL INQUIRIES TO:
E. M. Hamilton
Computer Center
George Washington University
2013 G Street, N. W.
Washington, D. C. 20006

*** S - GWU 03.8 07.6 06.5 - - - - ***

DESCRIPTION - This Assembly Language subroutine will replace any specified compiled format statement in the calling program with a format statement read at execution time. It will compile any valid FORTRAN IV-E specifications and is independent of any data set reference number definition.

PROGRAMMING SYSTEMS - The subroutine, written for 360 O/S, is independent of any particular release.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360. Uses approximately 2,300 bytes of core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.4.010 *N
SUBROUTINE OBJFMT

AUTHOR: E.M. Hamilton

DIRECT TECHNICAL INQUIRIES TO:
E.M. Hamilton
Computer Center
George Washington University
2013 G. Street, N.W.
Washington, D.C. 20006

*** S GWU - 03.8 06.5 07.6 - - - - ***

DESCRIPTION - This subroutine will replace any specified compiled format statement in the calling program with a format statement read at execution time. It will compile any valid FORTRAN IV-E specifications and is independent of any date set reference number definition.

PROGRAMMING SYSTEMS - The Subroutine is written for S/360 DOS/TOS and is independent of any particular release. It is written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Uses approximately 2,300 bytes of core and is serially reusable.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.4.013
DOBOL - DISK INDEX SEQUENTIAL MACROS - 16K DOS COBOL

AUTHOR: D. C. Hansen

DIRECT TECHNICAL INQUIRIES TO:
D. C. Hansen
IBM Corporation

CONTINUED FROM PRIOR COLUMN

111 West St. John Street
San Jose, California 95113

*** N - - 00.4 06.0 - - - - - ***

DESCRIPTION - This program is a major modification to 16K DOS COBOL direct access macros. It will cover only the index sequential access method and will give to a COBOL user the ability to use his files effectively. There are eight Assembly Language macros which will reside in the source library. The macros will load, add, retrieve and update sequential, random and random-sequential files; retrieve and update and allow add to sequential, random and random-sequential files. The macros also allow for a master index, multiple extents and cylinder overflow tracks and overlap of processing with random read and write macros. Also, reorganization statistics will be available at the time the file is closed.

PROGRAMMING SYSTEMS - Written in Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Same as for 16K DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.014
BOS INDEXED SEQUENTIAL FILE MANAGEMENT SYSTEM SUPPORT FOR VARIABLE LENGTH UNBLOCKED RECORDS

AUTHOR: H. Katz

DIRECT TECHNICAL INQUIRIES TO:
H. Katz
IBM de Venezuela, S.A.
Apartado 388
Caracas, Venezuela

*** N - - 03.0 03.7 - - - - - ***

DESCRIPTION - IBM Type I support for BOS, at present, does not include the handling of variable length records under ISFMS. Therefore, it is the intent of these macros to provide an IBM S/360 user the capability to process variable length unblocked records by using macro statements in the same manner as he would process a standard fixed record length file. Care was taken to make all modifications compatible with the standard ISFMS and BOS 8K disk.

PROGRAMMING SYSTEMS - Written in BOS 8K Disk Macro Language and Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 30 with at least 8K core storage and 1 2311 disk.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.4.015
OS/360 FORTRAN E OBJECT TIME FORMAT SUBROUTINE

AUTHORS: F. D. Jaggar G. H. Devereaux
A. R. Hauser

DIRECT TECHNICAL INQUIRIES TO:
F. D. Jaggar
IBM Corporation
1111 Connecticut Ave., N. W.
Washington, D. C. 20036

*** N - - 12.0 - - - - - - ***

DESCRIPTION - This subroutine allows an E level FORTRAN programmer to use object time formatting in input/output statements. It was written as an aid to conversion of programs from 7094 FORTRAN IV to FORTRAN E. The subroutine may, with modification, be used with BPS FORTRAN.

PROGRAMMING SYSTEMS - Written in FORTRAN.

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MINIMUM SYSTEM REQUIREMENTS - Same as for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.4.016 *M
CONVERSATIONAL PROGRAMMING SYSTEM

AUTHOR: D. Schroeder

DIRECT TECHNICAL INQUIRIES TO:
E. J. Sumpter
IBM Corporation
Boston Programming Center
545 Technology Square
Cambridge, Mass. 02139

*** N - - - - - - - - - - ***

DESCRIPTION - Conversational Programming System is a time-sharing system which runs in a partition of OS/360 MFT II or MVT. It provides a conversational subset of PL/I and remote job entry to an OS/360 batch partition and remote job output to a designated terminal from a data set designated by any batch processed jot.

PROGRAMMING SYSTEMS -Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - Minor changes must be made to OS/360 and a new system generated. Conversational Programming System may be generated to a specific hardware configuration. An H-level memory supports two terminals leaving 64K for background partition. One million bytes of 2361 storage plus the H-level storage supports 60 terminals with 100K for background. Models 40, 50, 65, 75, and 67 Model I in 65 mode are supported.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Application Directory, CPS Terminal User Manual (GH20-0758), CPS Installation and Administration Manual (GH20-0759) and CPS Systems Programmer's Guide (GH20-0757).
MACHINE READABLE - Unloaded Partition Data Sets of the CPS System.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	9/800	28	01
		MT	9/1600	29	01
OPTIONAL	none	none			none

360D-03.4.017
PRINT SUBROUTINE FOR S/360 COBOL/ASSEMBLY

AUTHOR: C. R. Thompson

DIRECT TECHNICAL INQUIRIES TO:
C. R. Thompson
P.O. Box 12275
Research Triangle Park,
North Carolina 27709

*** N - - 06.7 08.8 - - - - - ***

DESCRIPTION - The "Print Subroutine for S/360 (COBOL/Assembly)" is designed to perform all the mechanistic procedures involved in printing. This routine provides the user with the ability of obtaining multiple copies of a report along with error recovery capability, from such things as paper tear and operator negligence, without having to rerun the job. Also, the routine assists the operator in aligning preprinted forms and reprinting single page errors as well as reprinting the entire report. The user can expect a gain in throughput due to less operator intervention and the error recovery capability. The design criteria of the routine negates file descriptions, I/O areas, select entries and data transfer instructions by the programmer. This will help standardize programming procedures yet not pose additional programming effort.

PROGRAMMING SYSTEMS - Written in Assembly Language; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as for System/360 operating under DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.

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MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTP*	00	none
OPTIONAL	none	none		none

360D-03.4.018 *M
UNIVERSITY OF RHODE ISLAND RAX MODIFICATIONS (URI RAX)

AUTHORS: G. E. Little D. E. Tetreault

DIRECT TECHNICAL INQUIRIES TO:
G. E. Little
University of Rhode Island
Computer Lab.
Kingston, Rhode Island 02881

*** N - RIRX 06.3 - - - - - - ***

DESCRIPTION - URI RAX consists of modifications to the framework of RAX, version one, modification level zero. ID number checking, basic 2740 Model 1 terminal support, terminal output diverted to the batch printer/punch, accounting file recovery, UCS buffer loading, 1130 CSMP, batch save/purge, terminal work files, FORTRAN DVCHK and OVERFL subroutines, an expanded FORTRAN library, and many other utility programs and system modifications are provided.

PROGRAMMING SYSTEMS - Written in FORTRAN. The object coding necessary for a complete system generation is provided. Supplements for the RAX users manual, the RAX operators manual, and the RAX system manual document all modifications. In addition, all modified source modules are provided to facilitate the incorporation of individual modifications in other versions of RAX.

MINIMUM SYSTEM REQUIREMENTS - Those needed for a minimum RAX configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	9/800	28	01
		MT	9/1600	29	01
		MT	7DC/800	26	01
OPTIONAL	none	none			none

360D-03.4.019
ARRAY PROCESSOR ACCESS METHOD FOR IBM SYSTEM/360 MODEL-44

AUTHOR: T. F. Block J. J. Cohen
J. F. Ruggiero J. I. Geary

DIRECT TECHNICAL INQUIRIES TO:
R. N. Hodgson
IBM Corporation
Houston Industry Development
6900 Farrin Street
Houston, Texas

*** N - - - - - - - - - ***

DESCRIPTION - The Array Processor Access Method for the System/360 Model 44 provides access to the Array Processor, Model 1 (2938-1).

PROGRAMMING SYSTEMS - Written in Basic Assembler Language. The user specifies 2938-1 operations to APAM 44 by means of a FORTRAN call statement. At the read/write and queued levels, APAM 44 constructs the necessary channel program and requests the 44 PS to initiate 2938-1 operations. At the EXCP level, APAM 44 has the ability to execute a user built channel program for a non-standard installation dependent function.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 44, 2939-1 plus any peripheral I/O equipment required by the 44 Programming System.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT

CONTINUED FROM PRIOR PAGE

BASIC	none	DTR	9/800 28	none
		DTR	9/1600 29	none
		DTR	7DC/800 26	none
OPTIONAL	none	none		none

360D-03.4.020
ARRAY PROCESSOR ACCESS METHOD FOR IBM 2938 MODEL 2 WITH IBM SYSTEM/360 MODEL 65 OR IBM SYSTEM/360 MODEL 75

AUTHORS: J. F. Ruggiero J. J. Cohen
R. F. Geller J. I. Geary

DIRECT TECHNICAL INQUIRIES TO:
R. Hodgson
IBM Corporation
Houston Industry Development
6900 Fannin Street
Houston, Texas

*** N - - - - - - - - - ***

DESCRIPTION - The Array Processor Access Method for System/360 Models 65 and 75 provides data management support routines for the 2938-2. The FORTRAN user specifies array processor operations via a FORTRAN CALL statement. EXCP, read/write, and queued levels of interfacing are available.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - The array processor access method requires RPQ No. 815188 in addition to the needs of FORTRAN IV-OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.021
DOS DISK JCB CONTROL

AUTHOR: F. G. Woodgate

DIRECT TECHNICAL INQUIRIES TO:
F. G. Woodgate,
The Standard Bank Ltd.
10 Clements Lane
London, E.C. 4, England

*** N - 0001F 05.2 07.0 - - - - - ***

DESCRIPTION - The BOS Disk Job Control Program is designed to eliminate the use of jcb control cards and thus speed processing. The program is supplied with an object deck of SYSEOJ, which is slightly altered, and to which the program, SYSFGW, is attached (within the phase SYSEOJ).

PROGRAMMING SYSTEMS - Written in BOS Assembler Language and was assembled and tested using Version 1 Modification 8 of the BOS Assembler (360B-AS-309).

MINIMUM SYSTEM REQUIREMENTS - A console typewriter, at least one disk drive, and a means of input for the card deck. The program is written for a five-drive system, but can be adapted to any other configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.4.022
CATALOGED PROCEDURES FOR OPERATION UNDER DOS/360

AUTHOR: W. A. Irvine

DIRECT TECHNICAL INQUIRIES TO:
W. A. Irvine

CONTINUED FROM PRIOR COLUMN

IBM France
36 Avenue Raymond Poincare
75-Paris 16, France

*** N - - 05.1 - - - - - ***

DESCRIPTION - The Catalogue Procedures Monitor Program allows the maintenance and use of the DOS procedure library. The procedures are composed of any system or program data cards which, when required, may be called from the library and used to create automatically in input job stream on disk.

The program can be used in the foreground and background, and will create independent job streams for multiprogramming requirements.

Procedures are called using the console typewriter or control cards. Parameters allow temporary modification of job control cards, and label cards can be updated. 2311 or 2314 direct access devices are supported.

The monitor was written-
- To minimize the number of cards to be handled by the operators.
- To facilitate the use of the card reader in a foreground partition by reading system and program data from a disk unit.
- To provide automatic label card updating facilities.

PROGRAMMING SYSTEMS - Written in Assembler Language and the operating system required is DOS/360.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30, 24K storage, Decimal Arithmetic feature and DOS system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.023
ENGINEERING SPOOLING PROGRAM

AUTHOR: T. R. Price

DIRECT TECHNICAL INQUIRIES TO:
T. R. Price
IBM Corp.
3130 N. Meridian St.
Indianapolis, Ind. 46208

*** N - - 16.8 - - - - - ***

DESCRIPTION - The Model 44 Engineering Spooling Program (ESP) modifies the S/360 Model 44 Programming System to permit I/O requests for the card reader, printer, and punch to be intercepted and satisfied by high speed core-to-core transfers. Jobs which involve I/O operations at the read/write level can operate without change. This program attempts to read cards ahead of their actual use, storing them in internal core buffers and on a disk. Printer and punch records are also similarly queued. Up to 200 cylinders of a 2311 or SDSD can be utilized for reader, printer, and punch image queuing.

PROGRAMMING SYSTEMS - The ESP package is written in 44PS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - 25K to 41K, depending on user-specified buffer sizes. A 128K or 256K CPU is required to satisfy the combined requirements of 44PS and ESP. Unique device addresses for reader, printer, and punch are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source Code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034023

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.024
DAPPO DOS - DEVICE AND PROGRAM PERFORMANCE OPTIMIZATION FOR DOS.

AUTHORS: W. E. Smith C. R. Thompson

DIRECT TECHNICAL INQUIRIES TO:
W. E. Smith
IBM Corporation
TP Customer Center
Dept.995, Bldg. 001,
Research Triangle Park, North Carolina

*** N - - 05.1 - - - - - - ***

DESCRIPTION - This is a system written to operate in conjunction with the Disk Operating System (DOS). Its purpose is to provide and automatic method for disk spooling of unit record I/O.

DAPPO offers the following -
- Increased throughput, since the BG is stripped of U/R I/O and is allowed to run at disk/tape speed.
- Ability to specify set-up-lines at job time to align critical forms.
- Ability to specify multiple "first" copies of output reports at job time.
- Provides a job time, in core carriage tape to handle skipping, spacing, and sensing of channel 9 and/or 12.
- Provides dynamic and automatic print/punch output to disk from BG and retrieval by FG.
- Ability to add extra copies during printing.
- Executes any DOS program without program alteration (including Type I,II,III - i.e. COS).
- Automatically handles all U/R I/O until terminated.
- Blank compression within print lines prior to placement on disk and expansion prior to actual print.
- File wrap-around facility for SAPPO SYSIN and area overflow for print/punch output.
- Multiple file output areas for print/punch.
- Provides a full disk SYSIN/SYSOUT (all records are variable length, blocked).
- Interrupt handler for DAPPO F2 Monitor, providing various user functions.
- A multiprogramming system that can be installed today without extensive training or coding.

PROGRAMMING SYSTEMS - Programming language is Basic Assembler Language. Operating system required is DOS.

MINIMUM SYSTEM REQUIREMENTS - 64K System/360, Storage Protect, Interval Timer, 1-2311 Disk Volume; requirements for DOS system used must be satisfied.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034024

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.025
HIGH RATE PRINTER ROUTINE FOR COBOL PROGRAMS

AUTHOR: V. M. Sassone

DIRECT TECHNICAL INQUIRIES TO:
V. M. Sassone
Brookhaven National Laboratory
32 Brookhaven Avenue (ADP)
Upton, New York 11973

*** N - - 06.8 00.7 - - - - - ***

DESCRIPTION - The COBOL High Speed Printer Routine is designed to provide the COBOL user with maximum printer efficiency, thus reducing the execution time of COBOL programs. Execution time may be linked with COBOL or Assembler written programs.

PROGRAMMING SYSTEMS - Programming language - DOS/TOS Assembler Language. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 equipped with a 1403 or 1443 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034025

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none

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OPTIONAL	none	none		none

360D-03.4.026
BSAM SUBROUTINE PACKAGE FOR OS 360, VERSION I

AUTHOR: C. M. N. Cree

DIRECT TECHNICAL INQUIRIES TO:
C. M. N. Cree
IBM Scientific Center
6900 Fannin Street
Houston, Texas 77025

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DESCRIPTION - A set of OS FORTRAN-callable subroutines which permit the user to take advantage of OS Basic Sequential Access Method capabilities. Supported macros are OPEN, CLOSE, READ, WRITE, CHECK, NOTE, PCINT, BSP, PRTOV, and FEOV. Use of these routines in place of unformatted FORTRAN I/O statements typically reduces execution times significantly. (35% reduction on a Model 50 and 81% reduction on a Model 44 have been achieved.)

PROGRAMMING SYSTEMS - The subroutines are written in OS Assembly Language. Coding suited to the Commerical feature on the Model 44 can be generated through conditional assembly.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360 (64K core storage).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034026

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.027 *M
FORTRAN RANDOM I/O SUBROUTINE

AUTHOR: H. P. Sieglaff

DIRECT TECHNICAL INQUIRIES TO:
H. P. Sieglaff
3610 W. Northview
Phoenix, Arizona 85021

*** S MMC STAR 00.4 00.5 06.3 - - - - ***

DESCRIPTION - This subroutine provides a means to the FORTRAN programmer to write, read, and find logical records in random order on/from any combination of the 99 FORTRAN I/O units.

PROGRAMMING SYSTEMS - This subroutine was written and tested using OS FORTRAN 4 G Level, OS Version 13 on a S/360 Model 50, and a 2311 Disk Pack.

MINIMUM SYSTEM REQUIREMENTS - The package should work on any S/360 machine which has FORTRAN IV G and OS. (Maximum core requirements is 1K.)

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034027

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.4.028
2260 LOCAL TERMINAL USERS SYSTEM (LOTUS)

AUTHOR: S. R. O'Donnell

DIRECT TECHNICAL INQUIRIES TO:
S. Huffman
IBM Corporation
447 East Broad Street
Columbus, Ohio 43215

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DESCRIPTION - LOTUS is a programming system to support the implementation of multiple user applications in a

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multiple 2260 local terminal environment. The system consists of a macro generated monitor to multi-task the user programs and the I/O interface with the 2260 Terminals and a set of user macros to allow the application programs (ALP or COBOL) to communicate with the terminals and the LOTUS monitor. The main function of LOTUS is to permit users to design and write application programs based on conversational, single terminal logic. Each of these application programs, when run with a LOTUS monitor, will concurrently service up to 222 terminals in a multi-tasked mode. LOTUS also provides services such as program roll-in/roll-out, dynamically managed work disk, formatting and editing of terminal operator responses, and loading and retrieving of predefined screen images, all of which greatly reduce the complexity and size of user application programs.

PROGRAMMING SYSTEMS - Written in DOS III ALP and operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - LOTUS supports any mix of 2260's (Models 1 and 2), 2848's (Models 21 and 22, Models 1, 2, & 3 with EC9011), and 1053's (Model 4), that does not exceed a maximum of 222 2260's and 1053's.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034028

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.031 *N
KNUTH PROPOSAL INPUT/OUTPUT PACKAGE (KIOP)

*AUTHOR: Stephan Arnborg Juan Rodriguez-Rosell

DIRECT TECHNICAL INQUIRIES TO:
Stephan Arnborg (or) Juan Rodriguez-Rosell
Department of Information Processing
The Royal Institute of Technology
10044 Stockholm 70, Sweden

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DESCRIPTION - KIOP is an implementation of the I/O system proposed for ALGOL 60 by ISO, known as the "Knuth proposal". The system will edit output and de-edit input as specified by format strings, similar to formats and pictures of FORTRAN and COBOL, and procedure calls which set margins and tabulators. KIOP uses the same dd-names as 360 ALGOL standard I/O procedures and can be used concurrently with these. It has been used in a large number of student jobs and in research and production at Stockholms Datamaskincentral since July 1968. KIOP consists of a number of load modules, known to the ALGOL program as a set of "CODE" procedures. The modules must have been put in a job library or in the link library prior to use.

PROGRAMMING SYSTEMS - KIOP is written in Assembly Language (F), and has been compiled and tested on several versions of S/360 OS.

MINIMUM SYSTEM REQUIREMENTS - The system should run on any installation with S/360 OS ALGOL (F).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034031

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.4.033 *N
A 2250 MODEL 1 SIMULATION SUPPORT PACKAGE

AUTHOR: G.M. Stabler

DIRECT TECHNICAL INQUIRIES TO:
G.M. Stabler
Center for Computer & Information Center
Brown University
Providence, R.I. 02912

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DESCRIPTION - The 2250 Model 1 Simulation Support Package is a set of 360 and 1130 programs which allow graphics programs written for the 2250 Mod 1 or Mod 3 graphics display terminal to use the facilities of an 1130/2250 Mod 4 terminal with no reprogramming. The package supports Assembly Language graphics (GPS) as well as higher level languages (GSP, GPAK), and operates at the access method level.

PROGRAMMING SYSTEMS - Written in Assembly language and runs under MVT and (in the 1130) under the Disk Monitor. The 360 system must include Graphic Programming Services. Communications between the 360 and the 1130 subsystem are carried out over a high speed (40.8K BAUD) point-to-point line using a high speed bisynchronous communications access method (BSCAM) which is available from the Type IV library (Program numbers 360D-06.3.012 and 1130-06.3.005).

MINIMUM SYSTEM REQUIREMENTS - A 2250 Model 4 Terminal and those required to run OS/360 MVT.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034033

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.4.034 *N
PS44/2314 SUPPORT

AUTHOR: R.L. Jones

DIRECT TECHNICAL INQUIRIES TO:
R.L. Jones
Health Sciences Computer Center
660 West Redwood Street
Baltimore, Maryland 21201

*** S - - 03.0 05.2 - - - - - ***

DESCRIPTION - This program is designed to provide device for the 2314 DASD under PS44 in addition to other device support normally provided.

PROGRAMMING SYSTEMS - The program is written using the PS44 Assembler and is in the form of updates to the PS44 source code, Release 6. The 2314 DASD may be used for data files or for systems residence.

MINIMUM SYSTEM REQUIREMENTS - The same as those for PS44 plus the need for some model of the 2314 DASD.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D034034

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.5.005 *N
A SYSTEM TO PROCESS ABSTRACT CATALOGS AND RELATED INDICES

AUTHOR: SHARE Program Library & Distribution Project

DIRECT TECHNICAL INQUIRIES TO:
R.H. Wahlen
Staff Consultant
Cornell Aeronautical Lab. Inc.
P.O. Box 235
Buffalo, New York 14221

*** S XYZ BOIS 06.7 - - - - - - ***

DESCRIPTION - A System To Process Abstract Catalogs and Related Indices is a program which is a part of information dissemination and retrieval activities. The system will produce master abstract catalogs and indices covering all information sources publications, programs, audio-visual aids, seminars, etc.. The same data files from which these master references are produced will also serve as the source of information for preparing selective catalogs, indices and bibliographies of interest to users of IBM systems.

The purpose of this document is to describe that part of the system which is used in the preparation of program catalogs and their related indices. The programs involved are designed to accept input to data files, to process change

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transactions affecting data in the files, to extract data from the files according to specified keys, and to print formatted indices and abstract listings. From data stored in the system, the Catalog Processor will produce a catalog and a variety of indices. In developing the program, every effort was made to allow as much flexibility as possible in arranging data and formatting print-outs. Provisions are made to select particular sets of records from the total file, and to segment the various listings and indices according to types of program or other controls. Formats of listings as to line length, spacing, headings, etc., can generally be specified by the user through control cards entered at the time of execution of a particular program. A generalized overview of the system shows two basic operating phases: The first updates and maintains the file; the second is the text writing phase.

Each phase consists of several programs which manipulate the information stored in the integral data base. The word integral is used to emphasize the fact that it is a single data base, even though it is segmented into four major categories and may physically reside in one or more volumes or data sets. The four categories are as follows (a) Temporary Abstract Library (b) Permanent Abstract Library (c) Message Centers (d) Auxiliary Module Information Center (AMIC). Other sections of this text shall be devoted to a detailed discussion of the system flow and the data base.

PROGRAMMING SYSTEMS - The Catalog Processor is programmed for the IBM System/360 and was tested and installed under Operating System Release 15/16. All programs are written in PL/I, Version IV.

MINIMUM SYSTEM REQUIREMENTS - Uses the Queued Index Sequential Access Method (QISAM) when accessing data on direct storage devices. The largest program requires a partition of 140K for execution.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and abstract tape.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D035005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.5.006 *N
RDC/1 REPORT DATA ON CONDITION

AUTHOR: Vittorio della Calce

DIRECT TECHNICAL INQUIRIES TO:
Vittorio della Calce
Societa Itailana per l'Escercizio Telefonico
2, Via Gianturco
Roma

*** N - - 03.5 - - - - - - ***

DESCRIPTION - The RDC/1 is a program of general utility, working with DOS/360, which allows the printing of reports, based on information contained on magnetic tape file with fixed length records - blocked or not - and with standard labels, or else on a card file.

The specific characteristic of RDC/1 is the possibility of conditioning either printing of data and/or totalizations (at various levels) to the analysis of any code or code system present in the record itself upon which data are recorded. In addition to the data drawn out of the input file there is the possibility of printing - also on condition - constant information; both in header lines and in detail or totalization lines. The information needed for the printing is supplied by a series of program-cards which are written each time in an especially devised language, which is easily understood and of quick use.

PROGRAMMING SYSTEMS - Written in Assembler Language and operates using DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D035006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.5.007 *N
REPORT WRITER

AUTHOR: R. Karpinski

DIRECT TECHNICAL INQUIRIES TO:
R. Karpinski
Info. Services 76-U
University of Cal. Medical Center
San Francisco, California 94122

*** S UCS Ver1 - - - - - - - - ***

DESCRIPTION - This package provides a Report Writer facility in PL/I, similar to that in COBOL. The package uses PL/I compile time facilities to translate the special constructions into GOTOs, CALLs, LABELs, and PROCEDURES. Normal use involves two o/o include statements referring to an on-line library containing the two sections of code, labeled REP1 and REP2.

PROGRAMMING SYSTEMS - Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - Those required to run under OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D035007

	PROGRAM NUMBER EXTENTION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	ncne	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.001
FORTRAN CROSS REFERENCE

AUTHOR: R. H. Karpinski

DIRECT TECHNICAL INQUIRIES TO:
R. H. Karpinski
110 M.R.-4
University of California
Medical Cntr.
San Francisco, Calif. 94122

*** S USC XREF 00.0 03.2 - - - - - ***

DESCRIPTION - FORTXREF is a standard PL/I program using SYSIN for the input data and SYSPRINT for the output. The data consists of one or more FORTRAN programs. Each occurrence of a FORTRAN END card will cause the cross-referencing table to be output and reinitialized. This will also happen on end of data if the last card is not an END card. Each input card will be output with a FORTRAN line number if appropriate. The cross-reference table given (in 360 collating sequence) each keyword, variable name, statement number, and constant with a list of each use by line number. Inaccuracies- if "FORMAT" is used as an array name, the rest of the statement may not be use by line number. Inaccuracies- if "FORMAT" is used as an array name, the rest of the statement may not be cross referenced. Limits- 2000 items may be referenced approximately 6000 times.

PROGRAMMING SYSTEMS - Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.003 *N
COBOL CROSS-REFERENCE IN FORMAT OF ALP CROSS-REFERENCE

AUTHOR: R.S. Cahill

DIRECT TECHNICAL INQUIRIES TO:
R.S. Cahill
IBM Corporation
11141 Georgia Ave.
Wheaton, Maryland 20902

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DESCRIPTION - The Cross-Reference is a valuable tool for debugging and documenting while working with other languages. This program first lists the input source deck

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and assigns a sequential number. The statements that come from a partitioned data set as the result of "COPY" or "INCLUDE" are flagged with an asterisk. Also, COBOL reserved words used by programmers as user assigned names are flagged as errors. The second part of the output is an alphabetical listing of each user name followed by -
- How the name was defined, i.r., "FD", "01" or "PN" (for procedure name).
- The sequence number of the source card that defined the name was used.

PROGRAMMING SYSTEMS - Written in Assembler Language and designed to run under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D036003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-03.6.004
CROSS-REFERENCE LISTER FOR S/360 RPG CODED PROGRAMS

AUTHOR: R. G. Warner

DIRECT TECHNICAL INQUIRIES TO:
R. G. Warner
IBM Corp.
1814 Madison Ave.
Toledo, Ohio 43624

*** N - - 04.0 04.2 - - - - - ***

DESCRIPTION - The purpose of this program is to produce additional documentation to that supplied by the RPG Compiler. The output of this program is a listing indicating in which line of coding each field and each indicator is defined or used. This is useful any time a change or addition to a program is desired as it can easily be seen what effect this could have on existing portions of the program.

PROGRAMMING SYSTEMS - The Assembler Language source deck is easily modified to run on any 360 and under other operating systems.

MINIMUM SYSTEM REQUIREMENTS - The program is written to run under BOS on any S/360 Model 30 (or larger) with decimal feature, 2540, and 1403.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - none.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D036004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-03.6.005
OPERATING SYSTEM PL/I MACRO PREPROCESSOR

AUTHORS: P. E. Naykki D. J. Burke
D. R. Legrande

DIRECT TECHNICAL INQUIRIES TO:
P. E. Naykki
IBM Corp.
7700 Second Blvd.
Detroit, Mich. 48202

*** N - - - - - - - - - ***

DESCRIPTION - A program which accomplishes most of the replacement functions of the OS PL/I (macro) processor stage, such as compile - time functions, declares, and assignment statements. It reads PL/I source text, scans for known macro identifiers, calls macro routines which replace the identifiers with generated text, and writes the modified program text on a data set which is used as input to either the PL/I processor or compilation stages. Functions such as rescanning and compile, and time loop expansion are not accomplished. Major advantages - decrease compilation time by 30 to 55 percent; ability to use complete PL/I Language in compile - time functions; provide

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spacing and line control for neater PL/I source listings.

PROGRAMMING SYSTEMS - Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - Minimum configuration of Operating System/360 and two data sets. Occupies 40K of core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.006
COBOL CROSS REFERENCE AND RESEQUENCING PROGRAM

AUTHOR: J. F. Henderson

DIRECT TECHNICAL INQUIRIES TO:
J. F. Henderson
IBM Corp.
33 W. First St.
Dayton, Ohio 45402

*** N - - 02.0 03.2 04.2 04.6 - - - ***

DESCRIPTION -This is a set of two IBM-360 programs that will provide a cross reference listing, by sequence number, of COBOL source programs. Data and paragraph names are identified in alphabetic sequence and all reference to these names by procedure division statements are noted. All literals (except 0 and 1) and selected COBOL words are listed indicating their location within the procedure division. The user must provide a sort program of his choosing. In addition to providing a cross reference, provisions are made to -

Resequence a COBOL source deck... list a COBOL source deck... re-identify a COBOL source deck... any combination of the above - including cross reference... reproduce and/or list any card deck... multiple COBOL source programs can be processed in a "batch" environment. The cross reference listing can be extremely helpful in debugging COBOL programs. The resequencing and/or reidentifying functions should also prove useful as additional entries are made to the source program during the debugging stage.

PROGRAMMING SYSTEMS - The programs are written in COBOL under control of DOS. However, they could be adapted to any operating system by the user re-compiling and creating the necessary job stream and associated control cards.

MINIMUM SYSTEM REQUIREMENTS - 2540 Card-Read Punch, 1403 Printer, at least 1 tape drive, any other components

required for the sort the user chooses - this will also determine core requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.007
COBOL SOURCE CROSS-REFERENCE LISTING

AUTHOR: D. E. Oldham

DIRECT TECHNICAL INQUIRIES TO:
D. E. Oldham
Bell Helicopter Co.
Data Processing Dept.
P.O. Box 482
Fort Worth, Texas 76101

*** S BHC XREF 00.0 04.0 - - - - - ***

DESCRIPTION - The objective of this program is to produce a cross-reference listing of data-names, procedure-names, and paragraph-names from COBOL source statements, using the statement sequence number as the reference number.

PROGRAMMING SYSTEMS - Written in COBOL.

MINIMUM SYSTEM REQUIREMENTS - The COBOL-F sort vert is utilized by the program and requires three (3) sort work

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units (tape or disk).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.008
CHECKPOINT ASSIST SUBROUTINES

AUTHOR: J. K. Boggs, Jr.

DIRECT TECHNICAL INQUIRIES TO:
J. K. Boggs, Jr.
IBM Corporation
6900 Fannin Street
Houston, Texas 77025

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DESCRIPTION - The use of Operating System/360 checkpoint facilities requires that, upon restart, the operator have all volumes mounted and ready which were on-line when the checkpoint was taken. To assist in recording and then issuing "MOUNT" messages, two programs have been written. The first program is called MOUNT and should be called just prior to issuing a checkpoint. This program records Job Name, Step Name and all unit allocation for later use. The second program is called PREREST and is executed in lieu of the usual RESTART program. This program reads the data set written by the MOUNT program and issues mount messages to the operator describing completely the physical environment under which the checkpoint was written. These programs can be helpful in those shops which use the Operating System checkpoint facilities under many different application environment.

PROGRAMMING SYSTEMS - Operates under control of OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.009
OS/360 COBOL CROSS-REFERENCE AND RESEQUENCING PROGRAM

AUTHOR: A. I. Scher

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
1371 Peachtree Street, N.E.
Room 200
Atlanta, Georgia 30309

*** N - - 00.1 - - - - - - ***

DESCRIPTION - This is an IBM-360 program which will provide a cross reference listing, by sequence number, of COBOL source programs. Data and paragraph names are identified in alphabetic sequence and all references to these names by procedure division statements are noted. All literals (except 0 and 1) and selected COBOL words are listed indicating their location within the procedure division. In addition to providing a cross-reference, provisions are made to: (1) resequence a COBOL source deck, (2) list a COBOL source deck, (3) re-identify a COBOL source deck, (4) any combination of the above - including cross-reference, (5) reproduce and/or list any card deck. Multiple COBOL source programs can be processed in a batch environment.

PROGRAMMING SYSTEMS - The program is written in OS/360 COBOL F and uses the COBOL Sort feature to produce the cross reference listing. The cross reference listing can be extremely helpful in debugging COBOL programs. The resequencing and/or reidentifying functions should also prove useful as additional entries are made to the source program during the debugging stage.

MINIMUM SYSTEM REQUIREMENTS - 2540 Card-Read-Punch, 1403 Printer, and any other components required for the sort work files that the user chooses. By changing the "SELECT"

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statements in the COBOL source deck and compiling, any type of card reader, punch, and printer could be used. A punch is required only if the input cards are to be reproduced.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.010
JOB STREAM MANAGER OS/MVT

AUTHOR: E. J. Franklin

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation FSD
Dept. F14, Bldg. 4-1
P.O. Box 1250
Huntsville, Alabama 35807

*** N - - - - - - - - - ***

DESCRIPTION - Job Stream Manager, operating as a reader interpreter appendage, automatically classifies jobs according to their resource requirements (main storage, tape drives, disk space, etc.), and places the jobs into the appropriate input queues, optionally sets their priority according to their estimated time, and optionally records resource requirement statistics. The companion program analyzes the statistics and presents a summarized and/or detailed listing of the job stream requirements. JSM is designed to operate in an OS/MVT class scheduling environment.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires OS/360 MVT.

MINIMUM SYSTEM REQUIREMENTS - Those required to run OS/MVT.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
OPTIONAL	none	none		none

360D-03.6.011
SYSTEM/360 EXTENDED CARD EDITING PROGRAM

AUTHOR: L. H. Vaughan

DIRECT TECHNICAL INQUIRIES TO:
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69 Margaret Road
Newton, Massachusetts 02161

*** N - ECP1 00.0 06.6 - - - - - ***

DESCRIPTION - The Extended Card Editing Program (ECEP) is a high performance card manipulating utility designed to provide a convenient method for rapidly and economically editing small to medium size card files. Included among the major facilities of ECEP are:

I) Three distinct card editing formats providing extensive flexibility in the selection of data. Each format fully supports the following functions: a) Reproducing: any input fields to any output fields; b) Emitting: constant information may be inserted in any output fields; c) Interspersed master card gangpunching; d) Byte Manipulation: alteration of zone and numeric portions of bytes by constant zone-numeric data strings; transfer of zone and numeric portions of input data to output data. Over 400 tests may be performed to identify the various master and detail card type.

II) Two distinct numbering and two distinct counting routines which may be activated for any of six different card types. The number routines provide output in binary fixed point, or zoned or packed decimal. Any signed or unsigned starting value and increment may be used. The number routines also include a special increment feature designed to facilitate the numbering of master cards followed by a variable number of detail cards. The count routines may use constant count values or read interspersed count control cards. The count routines also offer

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independent numbering capabilities similar to those found in the numbering routines.

III) Optional listing facilities and additional control functions have been included. ECEP utilizes a highly efficient table lookup technique to perform most functions, thus obviating the need to optimize control card input. Since the entire generating program is always resident in core storage, multiple ECEP jobs may be loaded and executed.

PROGRAMMING SYSTEMS - ECEP will run under BPS/BOS/TOS/DOS control.

MINIMUM SYSTEM REQUIREMENTS - 16K core storage (ECEP as supplied uses approximately 10K bytes but may be expanded); Standard Instruction Set; one 1403, 1404, or 1443 for diagnostic and optional listing; one 1442, 2501, 2520, or 2540 for card input; one 1442, 2520, or 2540 for card output." The card input device must be distinct from the card output device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.012
PROGRAM FOR THE CREATION OF CROSS REFERENCE TABLES, FROM S/360 RPG SOURCE PROGRAMS, FOR INDICATORS AND FIELD NAMES

AUTHOR: H. Matezky

DIRECT TECHNICAL INQUIRIES TO:
H. Matezky
IBM (Israel) Ltd., Haifa Branch
2, Bank Street
Haifa, Israel

*** N - - 04.0 04.2 - - - - - ***

DESCRIPTION - The purpose of these programs is to create Cross-Reference tables in order to assist the programmer during debugging and modifications of RPG programs. The Cross-Reference is produced after two consecutive runs. The first program reads RPG Source Program cards and outputs records on a magnetic tape. An intermediate TOS/DOS sort sorts the created records. The second program reads the sorted tape and prints two Cross-Reference tables, for Indicators and Fields. Each Indicator and Field Name is sequentially indicated by line/page number, form type, and includes a description. This representation points the effect of each Indicator and Field Name usage upon the program.

PROGRAMMING SYSTEMS - DOS release 17, Source language PL/1 Subset.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 M25 and up with 24K, SYSRES unit tape or disk, at least 3 magnetic tapes, 2540, 1403, and Decimal Arithmetic.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.6.013
SYSTEM MANAGEMENT ROUTINES OS/MVT

AUTHORS: E. J. Franklin L. J. Hailey

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation FSD
Department F13/Building 4-L
P.O. Box 1250
Huntsville, Alabama 35807

*** N - - - - - - - - - ***

DESCRIPTION - System Management Routines are a series of inter-related, inter-dependent routines which are designed to aid in the operational management of OS/MVT. They are:

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(1) An in-line accounting routine for recording onto a) DASD, b) SYSOUT, and c) the console. (2) An accounting retrieval program to extract the accounting data from the DASD. (3) A revolving table storage routine which obtains the programmer and job names from the accounting routine and passes them to the SYSOUT separator. (4) An output writer separator which prints a) programmer name, b) routing number, c) jobname, and d) SYSOUT class or punches in column binary the a) programmer's name, b) routing number, c) jobname, and d) separator card. (5) A punch separator routine which separates the punched output into individual jobs using the special separator card for control. System Management Routines are designed to operate in an OS/MVT system with the Column Binary feature on the reader/punch.

PROGRAMMING SYSTEMS - Written in Assembler language.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/MVT.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.6.017 *N
PL/60

AUTHOR:
J.L. Vaira

DIRECT TECHNICAL INQUIRIES TO:
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The Bendix Corporation
Navigation and Control Division
Teterboro, New Jersey 07608

*** C 1613 - 12.2. - - - - - ***

DESCRIPTION - The PL/60 program converts 60 character PL/I to 48 character PL/I to aid in debugging programs using a machine equipped only with a 48 character print chain. It is an executable phase, used in place of PL/I.

PROGRAMMING SYSTEMS - Written in PL/I DOS subset, and can be used for any application in PL/I on a machine so equipped.

MINIMUM SYSTEM REQUIREMENTS - Normal requirements for a PL/I DOS D-level subset are in order. Also required, if the program is not to be changed; are a 2540 Reader-Punch Input, assigned to SYSIPT, and a 2400 Tape Unit, assigned to SYS004. The compiled program occupied 2293 bytes plus library functions.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.6.018 *N
NEATER: A PL/I SOURCE STATEMENT REFORMATTER

AUTHORS: K. Conrow R.G. Smith

DIRECT TECHNICAL INQUIRIES TO:
K. Conrow
Dept. Chemistry/Computing Center
Kansas State University
Manhattan, Kansas 66502

*** S KSU - 04.0 12.0 - - - - - ***

DESCRIPTION - The program (NEATER) accepts a syntactically correct PL/I program and operates on it to produce a reformatted version. It either prints or prints and punches the reformatted program in a logical or in a compressed format. It neatens the statements by omitting nonessential strings of blanks. Logical structure is indicated by indentation; the amount of indentation for each logical level is controlled by the user. Statement numbers are produced which correspond to those produced by the compiler. The program is extremely useful in development of complicated PL/I source programs because an unexpected

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indentation pattern will at once reveal logic errors. Logically formatted versions of complicated source programs are far more valuable in documentation of such programs than an unformatted source listing.

PROGRAMMING SYSTEMS - NEATER is written in PL/I; it operates successfully on itself; the submitted deck is in compressed format; the submitted listing is in logical format with the default indentation of 3 and serves as an example of NEATER's output. NEATER has been compiled and tested using OS Version 17 on a S360 Model 50.

MINIMUM SYSTEM REQUIREMENTS - 360 using full PL/I. Card reader, printer, a 2311 Disk could be used with "HASP" if desired.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D036018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.001
COBOL STACKER SELECT MACRO

AUTHOR: R. Fratarcangelo

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
1427 Genesee St.
Utica, N.Y.

*** N - - 06.0 - - - - - - ***

DESCRIPTION - The purpose of this macro is to allow the COBOL user to select input data cards. Two separate calls are required to cause stacker selection. The first call initiates the card read. The second call determines which pocket the card will be selected into and must be issued any time prior to the next read. The card does not physically get selected into the pocket until the next card feed cycle. This means that the programmer has unlimited time to determine into which pocket the card is to be selected.

PROGRAMMING SYSTEMS - Written in Assembler Language, operates under DOS, and is designed along the same lines as the DASD COBOL Macros.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.002 *M
MACROS FOR PACKED DECIMAL OPERATIONS AND BASE REGISTER CONTROL

AUTHOR: M. J. Matson

DIRECT TECHNICAL INQUIRIES TO:
M. J. Matson
2000 S.W. First Ave.
Portland, Oregon 97201

*** N - - 03.1 06.0 - - - - - ***

DESCRIPTION - This set of Macros is designed to simplify coding in Assembly Language. The initialization and sequence macro control base register assignment and maintenance. The arithmetic macros, ADD, SUB, MULT and DIVD provide packed-decimal alignment. The EDIT macro generates a mask and performs the edit. The PACK and UNPACK macro check for valid sign and generate one if a blank field is packed. The operator communication macros provide variable length messages and responses. The program and macro standards show a suggested standard that may be modified by changing the INIT, GOTO, SUBRX and LINKX macros. The user need only catalog those macros that will be of use to him. The sample program shows the macros in use and the generated code. The primary purpose of the sample program is to familiarize the user with generated code.

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PROGRAMMING SYSTEMS - Written in Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Operating under a System/360 with Decimal Instruction Set; 8K BPS or 8K BOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.003
8K BASIC OPERATING SYSTEM MACROS

AUTHOR: B. H. Dilley

DIRECT TECHNICAL INQUIRIES TO:
B. H. Dilley
711 Pennsylvania Ave.
Troy, Ohio

*** C 4826 - 01.8 06.4 06.0 - - - - ***

DESCRIPTION - The 8K BOS Macros are designed to facilitate programming through generation of pre-tested coding. Intricate coding techniques such as base register settings and table look-up are reduced to logical operations on the part of the programmer and/or systems analysts. Thereby more time can be devoted to problem solving and less time to intricate computer programming. Packed decimal macros are DIVIDE, MULTIPLY, SHIFT, ZERO, ADD, SUBTRACT, PACK, UNPACK, and EDIT. Packed or zone macros include COMPARE, RANGE, IFNUMERIC, BLANK and MOVE. Operator communictaion macros include TYPE and REPLY. Switch handling macros include macros (7 of them) to define, manipulate and interrogate program switches. Other macros include a powerful table look-up and a macro to define, load and communicate base register settings to the assembler.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Designed to be cataloged into the S/360 8K BOS Disk Compiler, and therefore will function on any S/360 the 8K BOS Disk Compiler will function on. Packed Decimal feature required for most of the macros.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.7.004
BOS/BPS MSG MACRO FOR DOS/TOS IBM SYSTEM/360 ASSEMBLER LANGUAGE

AUTHOR: E. L. Abt

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
520 Boylston St.
Boston, Mass. 02116

*** N - - 08.7 - - - - - - ***

DESCRIPTION - This set of three macros provides DOS/TOS Assembler Language programs the MSG Macro facility of BOS/BPS. The format and operation of the MSG Macro remains the same as under BOS/BPS. Two additional macros are provided. MSGX generates a closed subroutine to do the typing and response handling. Type generates a DTFCN for the console printer and is used by MSGX. The same console facilities may be used by the problem program as well.

PROGRAMMING SYSTEMS - Written in DOS/TOS Macro Language.

MINIMUM SYSTEM REQUIREMENTS - Same as for DOS/TOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037004

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.005
DATA MANIPULATION MACROS FOR THE SYSTEM/360 DOS/TOS

AUTHOR: P. J. Hamilton

DIRECT TECHNICAL INQUIRIES TO:
P. J. Hamilton
IBM Corporation
Dept. 867
Garden State Pkwy. Exit 136
Cranford, N.J.

*** N - - 06.6 - - - - - - ***

DESCRIPTION - These macro instructions allow the System/360 DOS/TOS Assembly Language programmer to move data, compute sums, compare fields, and initialize areas without having to write the machine instructions for format conversion, word boundary alignment, or length adjustment. They are written to manipulate fields and literals of type A,B,C,F,H,P,V,X,Y, and Z. They are designed with the greatest consideration given to object program efficiency.

PROGRAMMING SYSTEMS - Written in Assembly Language and requires DOS/TOS.

MINIMUM SYSTEM REQUIREMENTS - Those required for Disk and Tape Operating Systems.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.006
CHANNEL COMMAND WORD MACROS

AUTHOR: S. Auerbock

DIRECT TECHNICAL INQUIRIES TO:
S. Auerbock
IBM Corporation
330 Madison Ave.
New York City, N.Y. 10017

*** N - - - - - - - - - ***

DESCRIPTION - This Assembler Language macro instruction will aid the channel programmer. The macro includes the following features-

- Mnemonic channel commands for more common I/O devices. The user can expand or modify the table to include his own devices.
- Mnemonics for the flag bits. Flags not specified are generated as zero bits; hence the entire flag entry is optional.
- Implicit count field. If this optional entry is omitted, a count equal to the length of the I/O area is generated.

The macro will be especially valuable to users installing a 1418/1428 or 1287. Installations using non-standard labels will also find the macro useful.

PROGRAMMING SYSTEMS - Macro was written and tested using the S/360 DOS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The macro was coded and tested under the TOS/DOS system. It should run under the O/S Assembler.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.007
USEFUL BPS/BOS MACROS FOR IBM SYSTEM/360 ASSEMBLER LANGUAGE

AUTHOR: E. L. Abt

DIRECT TECHNICAL INQUIRIES TO:
E. L. Abt
IBM Corporation
Field Systems Ctr.
520 Boylston St.
Boston, Mass.

*** N - - - - - - - - - ***

DESCRIPTION - This set of macros provides higher-level coding for many common data processing programming needs. One group provides routines to generate, clear, pack, total transfer, cross foot, and summarize decimal fields. The UPSI and TEST macros convert the UPSI byte to character switches and test for on/off conditions. The BALRX macros generates base register loading and using statements. The CLEAR macro will clear any size area to any character. The MOVE macro will move any size area to another area. The TYPE and TYPEX macros generate a standard type routine. This is used by other macros for typing file names during OPEN, program check identification, I/O error handling, etc. Additional macros provide table look-up, date handling, page numbering, register saving, zone stripping, zero suppression, and zero filling.

PROGRAMMING SYSTEMS - The macros are written in 8K BPS/BOS Macro Language. They are being rewritten for DOS/TOS.

MINIMUM SYSTEM REQUIREMENTS - Those required for 8K BPS/BOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.008 *M
16K GENERAL PURPOSE MACROS

AUTHOR: B. H. Dilley

DIRECT TECHNICAL INQUIRIES TO:
B. H. Dilley
Assistant Manager of EDP Systems
Hobart Manufacturing Co.
711 Pennsylvania Ave.
Troy, Ohio 45373

*** C 4826 - 06.4 06.0 - - - - - ***

DESCRIPTION - The 16K General Purpose Macros are designed to assist the programmer using Basic Assembler Language. The macros facilitiate programming through generation of pre-tested coding. Intricate coding techniques such as base register settings are reduced to logical operations on the part of the programmer. Decimal arithmetic macros consist of ADD, SUBTRACT, MULTIPLY, DIVIDE, AND SHIFT. Operator communication macros include TYPE and REPLY using a 1052. Data Conversion macros are CALJL to two Julian dates. Other general purpose macros are BLANK, COMPARE, RANGE, EDIT, TABLE LOOK-UP, MOVE, PACK, UNPACK, ZEROP (zero packed fields) base register setting and communication, and switch definition and testing (SWON, SWOFF, IFON, IFOFF, SETON, SETOF, SETSB, IFONB, FTTR, FTNOP). The IFNUM macro is used to validate numeric fields. There are 31 macros in this package.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language. Source Language is 16K DOS/TOS Macro Language.

MINIMUM SYSTEM REQUIREMENTS - These macros are designed to be catalogued into the 16K DOS/TOS compiler and therefore will function on any S/360 the 16K DOS/TOS compiler will function on. The Packed Decimal feature is required for most of the macros.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR	9/800	28	none
		DTR	9/1600	29	none
		MT	7DC/800	26	01
OPTIONAL	none	none			none

360D-03.7.009
INDEX SEQUENTIAL FILENAMEC STATUS TESTING MACROS

AUTHOR: E. H. Dilley

DIRECT TECHNICAL INQUIRIES TO:
E. H. Dilley
Hobart Manufacturing Corporation
Troy, Ohio

*** C 4826 - 02.0 - - - - - - ***

DESCRIPTION - The IFER and IFERL Macros were designed to aid the programmer in testing the status byte (FILENAMEC) of index sequential files. The programmer is allowed to request testing of the status of a GET, PUT, READ, WRITE or SETL request against an Index Sequential file in symbolic terms which are meaningful to him. Program control is passed to the routine directed by the programmer for further detail action. Conditions tested for include DISKERROR, wrong length error, sequential end of file, no hit on random retrieval, illegal file limits, duplicate record, overflow area full, overflow record indication, prime area full, cylinder index full, master index full, and sequence errors.

PROGRAMMING SYSTEMS - Source Language is 16K DOS/TOS Macro Language (PAL). One user written macro (IFONB) Macro is called as an inner macro. The source for it is included.

MINIMUM SYSTEM REQUIREMENTS - A 16K Model 30 with a 1052 Typewriter and one or more 2311 Disk Drives is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.010
WRITE TO OPERATOR MACROS FOR DOS/TOS ASSEMBLER LANGUAGE

AUTHOR: E. L. Abt

DIRECT TECHNICAL INQUIRIES TO:
E. L. Abt
IBM Corporation
520 Boylston Street
Boston, Mass. 02116

*** N - - - - - - - - - ***

DESCRIPTION - This set of four macros provides DOS/TOS Assembler Language programs console communication facilities similar to that available in Operating System/360. The WTO macro allows the user to type up to 100 characters on SYSLOG, while WTOR will in addition accept a response of up to 100 characters. Both WTO and WTOR link to a closed subroutine generated by the WTOX macro. This routine in turn links to a standard DTFCN generated from the TYPE macro. The TYPE macro is the same as used by the MSG Macro program (360D-03.1.003) and can be shared by MSG macro processing. The same console facilities may be used by the problem program.

PROGRAMMING SYSTEMS - These macros are written in DOS/TOS language.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.011
AUDIBLE ALARM

AUTHOR: R. A. Mackinnon

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
112 East Post Road
White Plains, New York 10601

*** N - - 01.0 02.0 - - - - - ***

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DESCRIPTION - Audible Alarm is a System/360 macro definitior for support of the Control Alarm feature associated with the console typewriter. This feature can be ordered or is provided on a regular basis for System/360 except Model 30 where it is an RPQ. Control Alarm feature is useful in those cases where unusual operating conditions are detected by a program and the operator must be summoned to the console typewriter of a System/360 which may be running unattended over a period of time. Consequently, the macro could readily be placed in a DOS or TOS source statement library.

PROGRAMMING SYSTEMS - Audible Alarm is written as a Basic Operating System macro using the EXCP, WAIT, and CCB macros of that operating system.

MINIMUM SYSTEM REQUIREMENTS - Object machine requirements beyond the Control Alarm feature will be dictated by the program within which Audible Alarm has been invoked.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.013
DOS DTF AND PROCESSING MACROS FOR INDEXED OR SEQUENTIAL FILES ON THE 2311 OR 2321 WITH VARIABLE LENGTH RECORDS UP TO 30,000 BYTES IN LENGTH

AUTHOR: Mr. H. M. Knilans

DIRECT TECHNICAL INQUIRIES TO:
Mr. H. M. Knilans
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Los Angeles, Calif. 90005

*** N - - 01.6 03.4 06.7 - - - - ***

DESCRIPTION - The DTFTO (Define The File For Track Overflow) package is a set of macros written to build and process a 2311 or 2321 file. Records are automatically blocked and deblocked by the macro. Records up to 30,000 bytes in length may be manipulated by the user with a single GET, PUT, ADD, or DELET command. One keyword macro in the form of a DTF defines the file. An indexed file (up to 4 levels of indices are automatically generated) may have records loaded, retrieved, updated, deleted, or added. All processing may be random and/or sequential by key. Non-indexed files may be processed sequentially with all the capabilities mentioned above except adding records. A 2311 must be used to store the three highest levels of indices of an indexed file.

PROGRAMMING SYSTEMS - DTFTO runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - This package requires a minimum core storage size of 32K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.7.014
MACRO ASSEMBLER FOR S/360-MODEL 44

AUTHORS: Mr. T. Peterson Mr. A. Reiff
Mr. J. Wirth Mr. M. E. Ross

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
2930 W. Imperial Highway
Inglewood, Calif. 90303

*** N - - 03.0 03.1 - - - - - ***

DESCRIPTION - The Macro Assembler for 360/44 is designed to provide macro capabilities for the Model 44 Operating System. it is composed of six programs; 1) Assembler phase one, 2) Assembler phase two, 3) Decoder, 4) Encoder, 5)

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Macro library routine and 6) Library read routine.

Assembler phase one is the main routine. It calls and controls all other routines. The macro language is a subset of OS/360 Macro Language. This package also has library capabilities for system and user macro libraries.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-03.7.016
EXTENDED MNEMONICS USING REGISTERS FOR DOS/360

AUTHOR: Mr. L. G. Richards

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*** N - - - - - - - - - ***

DESCRIPTION - Extended Mnemonics Using Registers for branch to addresses is implemented using macros to supplement the DOS/360 Assembler. Many Assembler Language program errors can be traced to programmers selecting the wrong condition code to test when the address they want to branch to is contained in a register and therefore cannot use the extended mnemonics provided by the assembler. Likewise, programmer time is wasted in selecting the proper condition code. These problems are overcome by incorporating these 14 macros in the assembler library and allowing the programmer to use the extended mnemonics with register notation in the most natural manner.

PROGRAMMING SYSTEMS - Source - Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The macros may be used on any machine that fills the requirements of DOS/360 and are included in the DOS/360 assembler library.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.017
ALP DOS DECISION TABLE MACROS

AUTHOR: Mr. E. R. Harris

DIRECT TECHNICAL INQUIRIES TO:
Mr. E. R. Harris
IBM Corp.
P. O. Box 3337a
Savannah, Ga. 31403

*** N - - 10.3 - - - - - - ***

DESCRIPTION - A set of two macros for the coding and execution of limited entry decision tables in Assembly Language under DOS or OS. One macro, ("SETIT") sets switches which correspond to the condition entries of the decision tables. The other macro, ("TABLE") generates full word constants that are analogs of the decision table rules, and provides linkage to user written subroutines that correspond to the action statements. ("TABLE") also generates and provides linkage to, an off-line subroutine. This subroutine searches a decision table for the first rule whose conditions are satisfied, and then executes the action statement subroutines indicated by that rule. These macros make available the logical benefits of decision tables at the ALP coding level. They also augment documentation clarity, facilitate modular programming, and aid debugging.

PROGRAMMING SYSTEMS - Runs under DOS. Source Language

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is ALP.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 16K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.018
S/360 DISPLAY, ACCEPT AND ALARM MACROS FOR DOS ASSEMBLY LANGUAGE

AUTHORS: S. F. Scott Mr. R. K. Goran

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
520 Boylston St.
Boston, Mass. 02116

*** N - - - - - - - - - ***

DESCRIPTION - Display, Accept and Alarm are three macros which provide the DOS and TOS Assembler programmer with the ability to easily read data from the console, to write limited amounts of data on the 1052 Console Typewriter, printer and punch, and to activate the 1052 alarm. These macros are particularly useful for program debugging, for input of control information, and for output of small amounts of data. They use PIOCS and a common channel program, thereby using a minimum amount of core. Moreover, they are completely self-relocating.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Machine configuration required for operation of the users DOS or TOS plus Decimal Arithmetic. Alarm requires a Model 40 or above.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.019
IBM S/360 OS/360 SUMMARIZE MACRO

AUTHOR: Mr. M. Wapnitsky

DIRECT TECHNICAL INQUIRIES TO:
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Insurance Data Processing Center
80 Pine St.
New York, N. Y. 10005

*** S IDP - 06.1 - - - - - - ***

DESCRIPTION - The OS/360 SUMARIZE macro is designed to produce code to perform summarization at exits E25 and E35 of the OS/360 Sort/Merge program. SUMARIZE was written using the OS/360 Assembler F Macro Language. This is the first version of the macro prepared. SUMARIZE can be applied to all OS/360 Sort/Merge applications which require summarization performed at exits E25, E35 - either or both. SUMARIZE is a macro which generates in-line code to perform the summarization specified.

PROGRAMMING SYSTEMS - Requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - SUMARIZE can be used in any OS/360 configuration which supports Assembler E or F.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none

CONTINUED FROM PRIOR PAGE

OPTIONAL	none	none	none

360D-03.7.020
DOS UTILITY PROGRAMS AND MACROS TO PRINT FULL TEXT MESSAGES ON SYSLOG AND DEBUGGING AIDS AT PROGRAM CHECK OR OPERATOR COMMUNICATION TIME

AUTHOR: G. Anderegg

DIRECT TECHNICAL INQUIRIES TO:
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Von Roll Ltd.
CH-4563 Gerlafingen, Switzerland

*** N - - 04.6 06.6 07.0 08.7 - - - ***

DESCRIPTION - The purpose of these DOS utility programs and macros is to provide facilities to write to the operator and read from and to debug programs at progam check or operator communication time.

They consist of two different macros - The MESSAGE macro provides DOS Assembler Language programs console communication facilities. It allows the user to type up to 256 characters on SYSLOG and in addition accepts a response of up to 256 characters. The MESSAGE macro links to a basic subroutine generated by the PCHECK macro. This routine in turn calls the $$B-Transient program $$BAAB, which executes the data specified within the MESSAGE macro.

The PCHECK macro allows DOS Assembler Language programs debugging aids at program check or operator communication time, which may be very useful when a program is tested or specified routine, which is initialized by the PCHECK macro. This routine in turn calls the $$B-Transient program $$BAAC or $$BAAF. A part of the PCHECK macro is used by the MESSAGE macro as basic routine.

PROGRAMMING SYSTEMS - Programming language - Both macros are full self-relocatable and are written in DOS Macro Language. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.021
S/360 DOS MACRO FOR COBOL SUPPORT OF 2540 PUNCH-FEED-READ

AUTHOR: Mr. J. D. Ries

DIRECT TECHNICAL INQUIRIES TO:
Mr. J. D. Ries
IBM Corp.
801 Cherry St. S.E.
Grand Rapids, Mich. 49506

*** N - - 03.4 - - - - - - ***

DESCRIPTION - This Assembler Language macro allows the COBOL user to read and stacker-select input data cards from the punch side of a 2540 equipped with punch feed read. Two separate calls are used. The first initiates the card read. The second call determines into which pocket the card will be selected and must be issued anytime prior to the next read call. Since the card does not physically get selected into the pocket until the next read call, the programmer has an unlimited amount of time to determine into which pocket the card is to be selected.

PROGRAMMING SYSTEMS - This macro operates under DOS and is designed after the COBOL stacker select macro.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.022
1287-1288 INPUT CONTROL MACROS FOR DOS/TOS

AUTHOR: E. L. Abt

DIRECT TECHNICAL INQUIRIES TO:
E. L. Abt
IBM Corporation
112 East Post Road
White Plains, New York 10601

*** N - - - - - - - - - ***

DESCRIPTION - 1287-1288 Input Control Macros provide higher level support for the channel programming requirements of IBM's optical character recognition equipment for document mode. CCWOR provides: Coding facility for CCW generation for input areas defined by the DEFAREA macro. DEFAREA defines and provides a standardization of area names. CCWOR, using keyword operands, eliminates actual CCW coding for the 1287-1288.

PROGRAMMING SYSTEMS - Programming language - DOS/TOS Assembler Macro Language.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/TOS and the optical character recognition equipment.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.023
A DOS GRAPHIC PROGRAMMING SERVICES PACKAGE FOR THE 2250

AUTHOR: D. E. Woolley

DIRECT TECHNICAL INQUIRIES TO:
E. R. Root, Jr.
IBM Corporation
Bldg. 828, Area A
Wright-Patterson AFB, Ohio 45433

*** N - - - - - - - - - ***

DESCRIPTION - A graphic programming services package that supports the IBM 2250 Display Unit, Model 1 in a DOS environment, provides nearly all the facilities of OS/360 Graphic Programming Services for the IBM 2250 Display Unit (GPS/OS). These facilities enable the ALP programmer to code programs for the 2250 using read-write logic, without concern for CCW's and data bit configurations. The apparent differences from GPS/OS are synchronous entry only to user attention routines, the limitation to one I/O operation at a time, and first-in-first-out dequeueing of attentions.

PROGRAMMING SYSTEMS - All modules and routines are coded in Assembly Language, and all macros are coded in the DOS Macro-Definition Language. This program runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - The machine configuration required is the DOS minimum, the decimal feature, and a 2250 Display Unit, Model 1, with buffer. A DOS supervisor with TP-BTAM and the 2250 specified as a 2260 is required. No changes are made to any Type I program. The logic module requires 4K bytes, the DTFGR requires 22 words, and other control blocks and macro expansions require storage dependent on the application.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360D037023

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-03.7.024
PL/I - EMP INTERFACE MACROS

AUTHOR: E. Foeken

DIRECT TECHNICAL INQUIRIES TO:
E. Foeken
IBM Australia Ltd.
60 Market Street

CONTINUED FROM PRIOR PAGE

Melbourne, Vic, Australia 3000

*** N - - - - - - - - - - ***

DESCRIPTION - To allow the DOS PL/I programmer to make use of all Bill of Material Processor facilities, four macros have been provided. Two macros, PL$BM and PL$SH, are based on the COBOL interface macros provided with the BMP package and described in System/360 Bill of Material Processor (360A-ME-06X) Version 2 Programmer's Manual (H20-0246). These macros must be assembled and catalogued in the Relocatable Library in order to be included in retrieval programs. The macros PLCALL and PLEOJ are to be substituted for the EOJ statement. This can be done in the general source file or the statement can be replaced in the custcmized deck.

PROGRAMMING SYSTEMS - Utilizes DCS/360.

MINIMUM SYSTEM REQUIREMENTS - Those needed to run DOS Assembler Macros.

BASIC PRCGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTICNAI PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037024

	PRCGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
CPTIONAL	none	none		none

360D-03.7.025
CARRIER RETURN, LINE FEED ON THE 1052/53 MISLCNLF

AUTHOR: J. E. Jones

DIRECT TECHNICAL INQUIRIES TO:
J. E. Jones
IBM Corporation
100 Menlo Park
Edison, N.J. 08817

*** N - - 06.3 - - - - - - ***

DESCRIPTION - A DOS/360 Assembler macro designed to provide a common, easy to use facility for optimizing message preparation insofar as the idle character requirements after a carrier return/line-feed contrcl character is concerned. Any combination of accelerated or standard carriers and 10 or 12 characters per inch horizontal spacing on the IBM 1052/53 Printers is supported.

PROGRAMMING SYSTEMS - Written in Assembler Language; operates under DOS/360.

MINIMUM SYSTEMS REQUIREMENTS - Those required to run DCS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037025

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.026
DCLC A DOS/TOS/OS ASSEMBLER MACRO TO DEFINE A LOWER-CASE CHARACTER CONSTANT - DEFINE-CONSTANT-LOWER-CASE

AUTHOR: C. H. Meyer

DIRECT TECHNICAL INQUIRIES TO:
C. H. Meyer
IBM Corp. N.Y. Publishing
555 Madison Avenue
New York, New York 10022

*** N - - 06.6 - - - - - - ***

DESCRIPTION - The DCLC macro permits assembly of a character constant which contains lower-case letters, without the necessity of over-punching a character constant or assembling the constant in hex. The operand of DCLC is almost identical to the operand of a -DC- instruction for a character constant, including optional length and/or duplication factor. The macro then builds the necessary -DC- in which all the original alphabetics are converted to lower-case letters. Two special characters are used to indicate that either the next letter or next word are to remain in upper-case. These two characters do not appear in the final constant. All other special characters are assembled without change. This macro is useful in

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computer letter-writing applications, or any program in which printed output is desired in upper and lower case letters.

PROGRAMMING SYSTEMS - Written in Assembler langauge.

MINIMUM SYSTEM REQUIREMENTS - Any DOS, TOS, or OS Assembler.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037026

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.027
EDIT MACRO FOR DOS, TOS, OR OS ASSEMBLY LANGUAGE, S/360

AUTHOR: N. D. Jones, Jr.

DIRECT TECHNICAL INQUIRIES TO:
N. D. Jones, Jr.
IBM Corporation
Dallas Commercial
2911 Cedar Springs Road
Dallas, Texas 75219

*** N - - 03.1 - - - - - - ***

DESCRIPTION - EDIT Macro for DOS, TOS, or OS Assembly Language is a programming aid for easy coding of editing instructions. Standard amount (with or without sign control) and date field editing is easily acccmplished; along with floating dollar sign and asterisk protection of amounts. Other editing facilities are also implemented. The primary purpose of this macro is to eliminate the need of using or remembering the hex code representations for fill, select, significance, and editing characters used in editing. Also, good documentation of edit formats are provided through the use of the EDIT Macro.

PROGRAMMING SYSTEMS - Written in S/360 Assembly Language; operates under OS, DOS, or TOS.

MINIMUM SYSTEM REQUIREMENTS - Any system using DOS, TOS, or OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037027

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.028
DOS MACRO FOR TYPEWRITER INPUT/OUTPUT

AUTHORS: R. L. Downey, Jr. B. Dianne McLeod

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
6900 Fannin Street
Houston, Texas 77025

*** N - - - - - - - - - ***

DESCRIPTION - The TYPE macro allows the DOS user to easily read data from or write data on the 1052 Console Typewriter. The macro will output a literal (parameter enclcsed in quotes) or a data field on SYSLOG. If a reply is requested, a message 'AWAITING REPLY' will be typed and the user can enter data specified by the second parameter.

PROGRAMMING SYSTEMS - Written in Assembler language; operates under DOS/360.

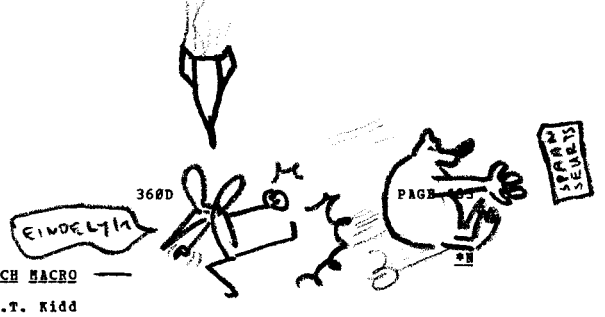
MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037028

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT



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BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.031 *N
DOS MACROS TO DUMP ISAM FILES FROM 2311 OR 2314 TO TAPE
RESTORE FROM TAPE TO 2311 or 2314

AUTHOR: B.H. Dilley

DIRECT TECHNICAL INQUIRIES TO:
B.H. Dilley
The Hobart Manufacturing Co.
711 Pennsylvania Avenue
Troy, Ohio

*** N - - 03.4 - - - - - - ***

DESCRIPTION - These three macros will generate programs to sequentially retrieve indexed sequential files from either 2311 or 2314's and write these files on tape. Macros are also provided to reload index sequential files from this tape. As an option at object time records flagged for deletion may be dropped as the file is reloaded. Records to be dropped must be uniquely identified by a one byte code. The key of a record which is dropped during the reloading is printed. Several special macros are used as inter-macros in this package, however, all these macros (which are presently available from PID) are included in the distribution of the index sequential dump restore macros.

PROGRAMMING SYSTEMS - Written in DOS Macro language.

MINIMUM SYSTEM REQUIREMENTS - Designed to be catalogued into the source statement library of the disk operating system. The macros will function on any 360 capable of using DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037031

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.7.032 *N
IBM 1500 LANGUAGE DRILL PROGRAMS AND GENERATORS

AUTHOR: Mrs. Betty Weneser

DIRECT TECHNICAL INQUIRIES TO:
Mrs. Beverly Siegel
Director of CAI Center
State University of New York
Stony Brook, N.Y. 11790

*** N - - 03.6 - - - - - - ***

DESCRIPTION - Three generator programs written in PL/IF (Version 4, Release 17B) for OS/360 produce segments of language drill courses to be run on the IBM 1500 Instructional System. Input is minimal control information plus question and answer text in a form easily created and reviewed by authors. Output is Coursewriter II code ready for assembly on the 1500. One generator produces lessons; the second produces programs tc list lesscn content; the third produces control programs that permit the language drills to be administered in a variety of ways.

PROGRAMMING SYSTEMS - Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037032

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-03.7.033
BINARY SEARCH MACRO

AUTHOR: G.T. Kidd

DIRECT TECHNICAL INQUIRIES TO:
G.T. Kidd
Simon Fraser University
Burnaby, British Columbia
Canada

*** N SPU - - - - - - - - - ***

DESCRIPTION - The BINARY SEARCH MACRO allows creation of coding within an assembler program to do a binary search table lookup on a given table. The table entries may be up to 32,767 bytes in length. Comparison between a given argument up to 256 bytes in length, and an argument appearing anywhere in the table entry is done. This proceeds until a found or not found condition can be determined. The table searched is assumed to be core resident. The beginning of the table is assumed to be addressable by the program. The sample programs provided for use on OS or DOS contain considerable documentation to facilitate the use of the macro.

PROGRAMMING SYSTEMS - The programs have been tested using DOS release 19 and OS release 13. The Assembler (F) compiler was used in each case.

MINIMUM SYSTEM REQUIREMENTS - For OS or DOS whichever is used. The Decimal Arithmetic Feature is required by the sample programs. The sample program requires 44K bytes to be available for execution. This can be reduced by making the 32K table area smaller.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D037033

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-03.8.001
CONSOLE MESSAGE SUBROUTINES FOR S/360 RPG

AUTHOR: W. B. Maher

DIRECT TECHNICAL INQUIRIES TO:
W. B. Maher
IBM Corp.
2640 Canal St.
New Orleans, La. 70119

*** N - - 01.4 - - - - - - ***

DESCRIPTION - This subroutine will print variable length console messages initiated by an RPG program on a 1052 Console Typewriter. Since the console is unsupported by System/360 RPG, a subroutine such as this one will be necessary to utilize the console. To use the subroutine the RPG programmer states the message and its length and exits in his calculation specifications. The program is written in Assembly Language and will run under the Basic Operating System.

PROGRAMMING SYSTEMS - Written in Assembly Language and runs under BOS.

MINIMUM SYSTEM REQUIREMENTS - Those required for BOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.002
FORCOM-360

AUTHORS: J. L. Wise R. B. Baden
R. K. Louden

DIRECT TECHNICAL INQUIRIES TO:
J. L. Wise
IBM Corporation
New York Field Systems Center

CONTINUED FROM PRIOR PAGE

625 Madison Ave.
New York, N. Y.

*** N - - 00.1 - - - - - - ***

DESCRIPTION - The FORCOM-360 package is a modification of the 1130 Commercial Subroutine Package (1130-SE-25X). It is a set of seven FORTRAN subroutines which can be assembled and used with 360 BPS FORTRAN and other IBM 360 FORTRAN compilers of which the BPS FORTRAN Language is a subset. It provides the FORTRAN user with the ability to perform the basic functions of commercial programming. The following commercial capabilities are provided- floating dollar sign and asterisk check protection, alphameric move and compare operations, the ability to read unformatted records, complete input/output character editing, with zone punch manipulation. The package is modular in design, and consists of the following subroutines MOVE, EDIT, GET, PUT, NCOMP, NZONE, FILL.

PROGRAMMING SYSTEMS - Written in BPS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - FORCOM-360 will operate in any environment acceptable to the 360 FORTRAN Compiler being utilized. The subroutines require no input or output devices themselves. Using BPS FORTRAN, approximately 13K bytes are required for the compiler and all subroutines. 32K is therefore recommended as a minimum system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.003
WEEKDAY

AUTHOR: R. L. Conner

DIRECT TECHNICAL INQUIRIES TO:
R. L. Conner
IBM World Trade Corporation
201 E. 42nd Street
New York, New York 10017

*** N - - 42.3 29.0 - - - - - ***

DESCRIPTION - Weekday is a subroutine which will determine the day of the week for any date in the Gregorian calendar from AI October 15, 1582 to February 28, 4000 inclusive. Weekday occupies fewer than 160 bytes. It is coded as a serially-reusable subroutine. It is invoked by the OS/TCS/DOS CALL statement - thus, it can be used by programs coded in Assembler Language, COBOL, PL/I or FORTRAN.

PROGRAMMING SYSTEMS - Written in Assembler Language; operates under OS, TOS or DOS.

MINIMUM SYSTEM REQUIREMENTS - It operates on any System/360 that has the standard and decimal feature instructions.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.004
RPGAID - AN RPG DEBUGGING TOOL UNDER DOS

AUTHOR: G. P. Sammons

DIRECT TECHNICAL INQUIRIES TO:
G. P. Sammons
IBM Corporation
2911 State Street
Erie, Pa.

*** N - - 04.2 03.5 - - - - - ***

DESCRIPTION - The RPGAID subroutine is an Assembler routine which lists all the indicators that are on during the execution of an RPG program under DOS. It is a valuable aid in debugging complex RPG programs, especially ones involving matching records. It can also prove useful to a programmer who is just beginning to work with RPG, since he can check what he believes to be the logic flow of the

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program against the indicator listing. Only two cards have to be placed in the calculation specifications of the main program. The Autolink feature of DOS establishes the required linkage. A maximum of 43 indicators, including numeric, level, halt, and the matching records indicator can be displayed. When the exit is placed at the end of the calculation specifications, the indicators shown are those on prior to entering the output specifications.

PROGRAMMING SYSTEMS - Written in RPG; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.005
BINARY FUNCTIONS ADDED TO FORTRAN IV (BPS)

AUTHORS: J. E. Cain R. E. Meyers

DIRECT TECHNICAL INQUIRIES TO:
J. E. Cain
IBM Corporation
P. O. Box 3467
Santa Barbara, California

*** N - - 41.0 06.6 - - - - - ***

DESCRIPTION - These subroutines perform FORTRAN functions not available in 360 BPS or E level FORTRAN. The package includes "or" and "and" functions and subroutines, shift right and left, and a random number generator with its corresponding random number set. These routines were written in Basic Assembler Language, and have been used in both BPS FORTRAN and pre-beta FORTRAN E level programs.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - These routines require approximately 1200 bytes in total and can be used individually. The machine requirements are the same as are needed by the FORTRAN being used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.006
XEROX INFORMATION SYSTEMS DIVISION ACCOUNT ROUTINE

AUTHOR: R. M. Place

DIRECT TECHNICAL INQUIRIES TO:
R. M. Place
Xerox Corporation
1350 Jefferson Road
Rochester, New York 14623

*** S XEC - 01.0 01.4 - - - - - ***

DESCRIPTION - The "Xerox Information Systems Division Account Routine" is distributed as an Assembler Language macro which is expanded by the user. The expansion is link edited into the Job Scheduler of OS/360. The account routine records accounting information on a direct access device without requiring any job control statements to support it.

PROGRAMMING SYSTEMS - Written in Assembler Language; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038006

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.011
ALPACA

AUTHOR: GEO Space Corporation

DIRECT TECHNICAL INQUIRIES TO:
R. E. Hickey
GEO Space Corporation
5803 Glenmont Drive
Houston, Texas 77036

*** N - - 07.0 08.6 - - - - - ***

DESCRIPTION - ALPACA is a set of FORTRAN-callable subroutines which generate image data for output on the IBM Type 1780 Model 2 (Geo Space DP 203B) Photographic Plotter.

PROGRAMMING SYSTEMS - Programming language - OSH-level FORTRAN IB and OS F-level Assembly Language. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS For ALPACA/OS image generation: A System/360 Model 30F or better with the minimum configuration required to run OS/360; an additional disk drive (either an IBM 3211 or an IBM 2314 module) on a selector channel; and problem program core storage of at least 41000 bytes. The system requirements for the ALPACA/OS Final Plot routine (FNPLT) are the same as for image generation with the following additional requirements: A Geo Space DP203B (IBM Type 1780 Model 2) Photographic Plotter on a selector channel different from the selector channel to which the disk drive containing the input data is attached; and a problem core storage of at least 66000 bytes (i.e., at least a G level machine).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.013
PL/I STRING FUNCTIONS

AUTHOR: P. Lacouture

DIRECT TECHNICAL INQUIRIES TO:
Theresa O'Connor
Yale Computer Center
175 Whitney Ave.
New Haven, Conn. 06520

*** S YU - - - - - - - - - ***

DESCRIPTION - PL/I allows the programmer to manipulate character string data with a great deal of flexibility. The operator, II, and the built in functions INDEX, SUBSTR and LENGTH provide a means for scanning, preparing and parsing text. While these functions are sufficient to perform almost any character string manipulations the programmer desires, they must often be called repeatedly to achieve the desired effect. The string functions described in the enclosed write up are derived from a set of operators for PL/I proposed by Dr. Robert F. Rosin. ("STRINGS IN PL/I", SIGPLAN NOTICES 'PL/I Bulletin No.4' Volume 2 No. 8, Aug., 1967.) They are designed to complement the facilities already available in PL/I.

They may be divided into three groups for purposes of discussion:

1. BEFORE, UPTO, FROM, AFTER, IN, DELETE, DELETS, REPLACE, REPLS, REVERSE, and SCOUNT--all of these return strings or values and all except DELETE, REPLACE, and REPLS set a success variable which may be tested (see below).

2. FAIL and SUC--functions that are the result of the previous string function and return '0' (failure in the previous function). Prior to the invocation of any string function, the success variable has the value '1' (success).

3. SETSUC--function that is used to set the success variable to either value.

PROGRAMMING SYSTEMS - The functions themselves are written in PL/I and have been compiled and tested using PL/I Version 4 on an OS/MFT based system on an S/360 Model 50.

MINIMUM SYSTEM REQUIREMENTS - 360/30 64K.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-03.8.015
A PLAN FOR A LINKED-DIRECT FILE, WITH OPERATING ROUTINES, IN COBOL

AUTHOR: H. Colter

DIRECT TECHNICAL INQUIRIES TO:
DIRECT TECHNICAL INQUIRIES TO:
D. Manor
c/o Mekoroth Water Co. Ltd.
9 Lincoln Street
Tel-Aviv, Israel

*** C 8052 - 01.6 - - - - - - ***

DESCRIPTION - The attached programs will create a sample Linked-Direct type file on a 2311 Disk and carry out, by way of demonstration, several standard operations on the file. These operations include: add-a-record, random retrieval of a record with amend and rewrite, random entry followed by sequential processing, and delete-a-record. The Linked-Direct file organization may be used with any application requiring disk files.

PROGRAMMING SYSTEMS - The language used is COBOL and the tests of these programs were made with the compiler included in Release 19 of the IBM System/360 Disk Operating System.

MINIMUM SYSTEM REQUIREMENTS - Any model System/360 Computer with 1 or more 2311 Disk Drives may be used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D038015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.003
COBOL CROSS REFERENCE PROGRAM

AUTHOR: D. E. Fowler

DIRECT TECHNICAL INQUIRIES TO:
D. E. Fowler
IBM Corporation
9045 Lincoln Blvd.
Los Angeles, California 90045

*** N - - 02.0 06.7 - - - - ***

DESCRIPTION - The COBOL Language has enjoyed wide acceptance among IBM customers as the coding language for commercial applications. The language provides excellent documentation and is easy to write. However, COBOL does not provide, as a normal by-product, documentation to aid the programmer in either conversion efforts or debugging efforts. The COBOL Cross Reference program lists each non-reserved key element (file name, data name, or paragraph name) and reports the card image of every statement which refers to that element. At a glance, a programmer can see the impact of a format change or a deletion. The program facilitates conversion by isolating all actions on key elements for review and reappraisal. The program is written in COBOL and is presently operational on System/360 under Operating System 360.

PROGRAMMING SYSTEMS - Written in COBOL; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT

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BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.004
CROSS-REFERENCE LISTING OF COBOL DATA-NAMES

AUTHOR: G. Ragsdale

DIRECT TECHNICAL INQUIRIES TO:
G. Ragsdale
IBM Corporation
3424 Wilshire Blvd.
Los Angeles, California 90005

*** N - - 12.0 - - - - - - ***

DESCRIPTION - This program creates a cross-reference listing of data-names used in the procedure division of a COBOL program. It creates the listing from source statements independent of the compiler. However, the reference numbers do correspond to the compiler statement numbers which means that sequence numbers are not required.

PROGRAMMING SYSTEMS - The Cross-Reference program is written in CCBCL F to run on a 256K or larger S/360 with the capability of being easily modified to run on a 128K S/360. The COBOL input program must be complete, however, it need not be S/360 COBOL. All sorting is done internally.

MINIMUM SYSTEM REQUIREMENTS - Same as that for OS with 128K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.0.005
PROGRAM CHECK INTERRUPTION MONITOR

AUTHORS: A. L. Danzis J. M. Mawicke

DIRECT TECHNICAL INQUIRIES TO:
A. L. Danzis
IBM Corporation
330 Madison Ave.
New York, N. Y. 10017

*** N - - - - - - - - - ***

DESCRIPTION - This is an operating system program designed to shorten debugging time by allowing the testing program to continue execution although program checks occur during execution. It allows up to ten program checks per test shot. Program Check Interruption Monitor is called at the very beginning of the users program. It issues the SPIE macro, then returns control to the user. When a program check occurs in the users program, the monitor will analyze the program check, and perform tests such as boundary alignment checks. It then prints on the console the hexadecimal location of the interrupt, the interrupt code, and other pertinent information, such as registers used and their contents, immediate operands, main storage addresses and their contents. In addition, the monitor will cause an ABEND if ten program checks occur, if a program check occurs at the same instruction address more than once, if an imprecise program check occurs, or if the monitor is unable to continue testing of the problem program.

PROGRAMMING SYSTEMS - Written in Assembler Language and OS/360 is required.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 in an OS environment and requires about 3,200 positions of main storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.006
CLOCK

AUTHOR: W. S. Page

DIRECT TECHNICAL INQUIRIES TO:
H. R. Hamilton
North Carolina State University
P. O. Box 5445
Raleigh, N. C. 27607

*** S NCS - 99.0 - - - - - - ***

DESCRIPTION - A subroutine to deliver readings of the S/360 real time clock to programs calling with a S/360 FORTRAN IV compatible linkage. Time elapsed since last call of subroutine can also be computed by the subroutine. Many separate "clocks" can be kept running within the calling program.

PROGRAMMING SYSTEMS - Requires S/360 OS.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.007
FACILITY FOR LISTING, UPDATING AND INTERPRETING DECKS

AUTHOR: P. Shafer

DIRECT TECHNICAL INQUIRIES TO:
P. Shafer
IBM Corporation
Department D86, Building 706
Poughkeepsie, New York 12601

*** N - - 00.0 - - - - - - ***

DESCRIPTION - This program provides any programmer with a flexible tool to help maintain and debug object programs. It has been developed for use in minimal OS/360 configurations, and is written in Assembly Language. It can be used (A) To generate hexadecimal, EBCDIC, and/or binary formatted listings, (in any combination); (B) To duplicate any deck, resequencing in column 73-80; (C) To update (automatically patch) Assembler output decks (object decks), including ability to add code and expand program size, and generating a new object deck for linkage-editor input.

Advantages -
- Save programmer time during testing/debugging cycle.
- Facilitate maintenance.
- Fast recovery from damage to card decks.

PROGRAMMING SYSTEMS - Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - This program occupies approximately 10K bytes of core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.008
DOS COBOL CROSS REFERENCER

AUTHOR: H. Hunger

DIRECT TECHNICAL INQUIRIES TO:
H. Hunger
IBM Corp. - N.Y. Retail
330 Madison Ave. - 3rd Floor
New York, N.Y. 10017

*** N - - 03.2 - - - - - - ***

DESCRIPTION - The DOS COBOL Cross Referencer provides a cross index of user defined data names. The program requires 16K and is unique because it allows the user at execution time to determine what words he does not want

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cross referenced; this allows the user to cross reference any COBOL program regardless of differences of reserved words.

PROGRAMMING SYSTEMS - Written in Assembler Language; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as DOS minimum requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.009
PCMSG - PROGRAM CHECK MESSAGE

AUTHOR: Virginia Lou Francis

DIRECT TECHNICAL INQUIRIES TO:
Virginia Lou Francis
Texas State Board of Control
Capitol Station
P.O. Drawer GG, ADP
Austin, Texas 78711

*** N - PCMS 00.5 01.5 03.7 - - - - ***

DESCRIPTION - This macro is intended as an aid to testing. It provides means to continue processing when a program check interrupt is encountered, by avoiding the abnormal EOJ DUMP. It should be stored in the user's Source Statement Library, to be called out later by the compile procedure. PCMSG macro should be placed at the beginning of the user program in order to intercept any program checks that may occur. The field of application includes any program which would benefit from processing beyond a program check interrupt.

PROGRAMMING SYSTEMS - Written in conditional assembly and Assembly language. This macro was compiled and tested in its present form on S/360 Model 30, DOS Release 11. It was originally tested on S/360 Model 65, DOS Release 14. This former version did not employ physical IOCS.

MINIMUM SYSTEM REQUIREMENTS - This program can be used on any S/360 Model 25 and up, using DOS. The console message is 36 characters in length. A printer is required if the PDUMP option is desired. The message and the PDUMP are accomplished by physical IOCS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.0.010 *N
SIMPLIFIED INPUT - OUTPUT AND DEBUGGING MACROS FOR ASSEMBLER LANGUAGE USERS

AUTHOR: J.R. Ehrman

DIRECT TECHNICAL INQUIRIES TO:
J.R. Ehrman
SLAC Computation Group
Standford, California 94305

*** S SLA - 03.7 04.1 07.4 08.0 - - - ***

DESCRIPTION - This set of five macro-instructions and four associated library routines provide the Assembler Language programmer with an extremely simple and useful set of input-output and diagnostic tools.

(1) The PRINTOUT macro prints the contents of memory areas in a format determined by the type of data it contains. (2) The PRINTLIN macro prints single line images. (3) The READCARD macro reads input data cards. (4) The PROLOGUE and EPILOGUE macros set up an error-handling linkage that allows a program to continue after progran interruptions, and provide PSW, register, and core dumps. The interface routines called by the macros use the FORTRAN I/O Library to do the actual input and output, and data formatting.

PROGRAMMING SYSTEMS - Written in Assembler Language F;

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operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE RADABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D040010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.001
OS/360 CORE DUMP MODULE

AUTHOR: R. G. Brown

DIRECT TECHNICAL INQUIRIES TO:
R. G. Brown
IBM Corporation
59 Maiden Lane
New York, N. Y.

*** N - - 08.4 08.5 04.6 - - - - ***

DESCRIPTION - This S/360 module enables the programmer to obtain a print-out of any or all of main storage associated with his program while it is executing. The three full-word input parameters to be specified are -

1. The address of the location to be printed.
2. The length of the area in bytes.
3. The output format to be used.

There are three choices of output format -

1. BCD only.
2. HEX only.
3. Both BCD and HEX -- the BCD character on print line 1 with the zone and numeric portion of the HEX character directly underneath on lines 2 and 3 respectively.

The module is optimized for minimum execution time. The module may be accessed in COBOL via the CALL statement or in Assembler Language via the CALL or LINK macro-instructions.

PROGRAMMING SYSTEMS - The source language is Assembler and it runs under the Operating System 360.

MINIMUM SYSTEM REQUIREMENTS - The program can be executed on any S/360 with the Standard Instruction Set and occupies 1,574 bytes of main storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.002
1620 EMULATOR MAPPED CORE DUMP PROGRAM

AUTHOR: J. H. Carman

DIRECT TECHNICAL INQUIRIES TO:
J. H. Carman
IBM Corp., Dept. 235
Endicott, N. Y.

*** N - - 02.0 04.0 11.1 - - - - ***

DESCRIPTION - Used with the 1620 Compatibility Feature, this program dumps 1620 mapped core on the printer.

PROGRAMMING SYSTEMS - Operates under 8K BOS.

MINIMUM SYSTEM REQUIREMENTS - A 16K 360 Model 30 with a card reader, printer, console typewriter, and the 1620 Emulator Feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041002

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.003
SEQUENTIAL DATA SET LISTER PROGRAM - OS/360 UTILITY

AUTHOR: J. A. Keller

DIRECT TECHNICAL INQUIRIES TO:
J. A. Keller
IBM Corp.
112 E. Post Rd.
White Plains, N. Y. 10601

*** N - - 00.0 - - - - - - ***

DESCRIPTION - An OS/360 program whose function is to list logical records from a sequential data set. Logical records are listed 100 characters per line group for as many line groups as are required to display an entire logical record.

The line group format is configured as follows -
- Line 1 Character representation (if printable)
- Line 2 Hex zone
- Line 3 Hex digit
- Line 4 Delineator line (numbered every 5 spaces).

The line group format is convenient for examining unprintable data and for locating particular bytes within a record by means of the delineator line. The program reads records with QSAM and produces the listing with QSAM. Input sequential record formats supported are- fixed, fixed blocked, variable, variable blocked.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those needed to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.1.004
INDEX SEQUENTIAL DATA SET LISTER PROGRAM - OS/360

AUTHOR: J. A. Keller

DIRECT TECHNICAL INQUIRIES TO:
J. A. Keller
IBM Corp.
112 E. Post Rd.
White Plains, N. Y. 10601

*** N - - 00.0 - - - - - - ***

DESCRIPTION - An OS/360 program whose function is to list logical records from an ISAM Data Set. Logical records are listed 100 characters per line group for as many line groups as are required to display an entire logical record.

The line group format is configured as follows -
- Line 1 Character representation (if printable)
- Line 2 Hex zone
- Line 3 Hex digit
- Line 4 Delineator line (numbered every 5 spaces).

The line group format is convenient for examining unprintable data and for locating particular bytes within a record by means of the delineator line. The program reads records with QISAM Scan Mode and produces the listing with QSAM. Input ISAM record formats supported are- fixed fixed blocked.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those needed to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.1.005
THREE D'S - DUMP, DISASSEMBLE AND DELINKEDIT

AUTHOR: Mr. I. M. Miller

DIRECT TECHNICAL INQUIRIES TO:
Mr. I. M. Miller
IBM Corp.
390 South Rd., Bldg. 703
Poughkeepsie, N. Y. 12602

*** N - - 05.3 12.1 - - - - - ***

DESCRIPTION - The Three D'S are a series of related programs which allow the user to convert machine language to Basic Assembler Language. The Disassembler accepts object decks composed of single CSECTS and translates them to Basic Assembly Language decks or listings. DISINF is a subroutine which enables the user to interface with the Disassembler to produce mnemonic dumps of core. The Delinkeditor allows him to convert load modules to object modules and then to source decks through the Disassembler.

Routines used are DISINF, the DISASSEMBLER, and DELINKED require 1K, 64K and 3K of core respectively. All three routines are designed to execute under OS/360, though with modifications they could execute under DOS.

PROGRAMMING SYSTEMS - All three programs are written in Basic Assembly Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - 64K, card reader, punch, printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.1.006
XXXFDUMP

AUTHOR: Caroline E. Craig

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
2930 W. Imperial Highway
Englewood, Calif. 90303

*** N - - - - - - - - - ***

DESCRIPTION - The XXXFDUMP Subprogram (Library Subprogram supplied with Basic FORTRAN IV (E) and FORTRAN IV (G, H, and Model 44)) dumps a specified area of storage in a specified format. A mnemonic format has been added to those provided in the Type I XXXFDUMP Subprogram and the capability to specify the area of storage as FORTRAN statement numbers.

PROGRAMMING SYSTEMS - Written in FORTRAN and uses OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 1766 bytes for OS, 1934 bytes for 44PS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.007
INDEX SEQUENTIAL FILE PRINT UTILITY PROGRAM

AUTHOR: C. Juett

CONTINUED FROM PRIOR PAGE

DIRECT TECHNICAL INQUIRIES TO:
C. Juett
IBM Corp.
4040 N. Fairfax Dr.
Arlington, Va. 22203

*** N - - 00.4 - - - - - - ***

DESCRIPTION - The Index Sequential File Print Utility Program is a 360 Operating System utility program written in Assembly Language which prints all records or a selected portion of those records that reside in an Index Sequential Data Set. Optionally, the data records may be converted to hexadecimal representation. Each record is printed on consecutive lines consisting of twelve groups of eight characters separated by two blanks. The data set name, logical record length, key length and relative key position are also provided on each printed page. This program is designed to aid those OS users who are using Index Sequential Files by providing a generalized Index Sequential File Print.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.008
DIRECT ACCESS STORAGE DUMP

AUTHOR: G. E. Mitchell

DIRECT TECHNICAL INQUIRIES TO:
G. E. Mitchell
Sun Life Assurance Co. of Canada
Technical Programming Department
P.O. Box 6075
Montreal 3, P.Q., Canada

*** N - - 00.0 - - - - - - ***

DESCRIPTION - The Direct Access Storage Dump program is designed to print all records on direct access volumes, without regard to data set boundaries. Areas to be printed are controlled by operator type-in, specifying the track at which printing is to begin, and the number of tracks. The output format is similar to a core dump under OS/360. The program has been tested using OS Release 14 MFT and MVT. It has been found useful in program testing and in determining the layout and contents of system data sets (i.e., VTOC, SYSCATLG). Devices acceptable to the program are 2311, 2314 and 2321 Direct Access Storage Drives.

PROGRAMMING SYSTEMS - Programming language is Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - 12K of core for execution, as well as a 1052 Console Typewriter for operator communication.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.009
OS/360 FORMATING STAND-ALONE CORE DUMP

AUTHOR: T. E. Jones

DIRECT TECHNICAL INQUIRIES TO:
T. E. Jones
IBM Corporation
100 S. Wacker Drive
Chicago, Illinois 60606

*** N - - 04.2 - - - - - - ***

DESCRIPTION - In the event of an OS/360 system ABEND error, this program will provide a core dump that is almost identical to the standard OS/360 ABEND dump, only from

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a stand-alone environment. In addition, it will dump any other non-OS core image omitting the OS/360 control block formatting. All of core is dumped with the exception of the first sixteen bytes. At the end of the dump, core is restored with the original information is saved so that in the event of a hardware both customer's program information and hardware logout information may be processed by this dump program and SEREP in that order.

Any messages to the operator are printed on the console typewriter and are self-explantory. Machine check interrupts are masked off, and unlimited error recovery is incorporated so as to insure dump output if at all possible. Printed characters are limited to standard alphabetics and numerics to substantially speed up output to a UCS printer. Likewise, output may be selected to tape or printer on any System/360 or 1400 system.

PROGRAMMING SYSTEMS - Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - The only restrictions are that the program must be run from tape, requires any System/360 Model 30 or larger, and must have a minimum core size of 32,768 bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.1.010
DEBUGGING AID FOR DOS PROGRAM TESTING

AUTHOR: S. Auerbach

DIRECT TECHNICAL INQUIRIES TO:
S. Auerbach
IBM Corporation
330 Madison Avenue
New York, New York 10017

*** N - - - - - - - - - ***

DESCRIPTION - This callable subprogram intercepts program checks, edits the error information and allows the program being tested to continue. When called from COBOL, the output can include the PMAP address of the erring instruction eliminating a hexadecimal subtraction.

PROGRAMMING SYSTEMS - Written in DOS ALP, includes an inline macro.

MINIMUM SYSTEM REQUIREMENTS - Requires 3K of main storage. Uses DTFDI for SYSLST output.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.1.011
S/360 POST MORTEM DUMP (PCP/MFT)

AUTHORS: R. L. Mortenson C. E. Burgert

DIRECT TECHNICAL INQUIRIES TO:
R. L. Mortenson
IBM Corporation
1400 Baltimore
Kansas City, Missouri 64141

*** N - - 02.5 - - - - - - ***

DESCRIPTION - This program is a stand-alone post mortem dump for OS/360. It provides the information given in a normal ABEND dump plus additional information gleaned by diagnosing and interpreting indicators found in UCB's, DEB's and IOB's. It prints out data that normally takes the programmer a great deal of research time to accumulate. Effectively, no useful information is lost because it uses the 1K of core assigned to the SVC transient area. The program is loaded from tape and the output can be either printer, tape or typewriter.

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PROGRAMMING SYSTEMS - It is written in BAL. The current version will work properly with either a PCP or MFT system.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D041011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.2.001
8K TRACE FOR IBM SYSTEM/360

AUTHOR: J. R. Webber

DIRECT TECHNICAL INQUIRIES TO:
J. R. Webber
IBM United Kingdom Ltd.
Newton House, Maid Marion Way
Nottingham, England

*** N - - - - - - - - - - ***

DESCRIPTION - This program will trace any user program written to run under BOS or BPS. By means of a control card, the user may have the instructions printed out as they are executed showing storage areas, register contents, current condition code and the address of the instruction being traced. Before execution of a SVC 0 the CCW chain is printed and after execution the actual record read or written. The control card specifies the address range of the instructions to be printed out, how many instructions are to be printed, and allows branch-only tracing. The user program requires no modifications to run under trace control. Trace occupies 1994 bytes of storage.

PROGRAMMING SYSTEMS - Operates under BOS or BPS.

MINIMUM SYSTEM REQUIREMENTS - Minimum required by BOS or BPS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D042001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.2.003
16K TRACE FOR IBM SYSTEM/360

AUTHOR: J. R. Webber

DIRECT TECHNICAL INQUIRIES TO:
J. R. Webber
IBM United Kingdom Ltd.
Newtown House, Maid Marion Way
Nottingham, England

*** N - - - - - - - - - ***

DESCRIPTION - This program will trace any user program written to run under DOS or TOS. By means of a control card, the user may have the instructions printed out as they are executed showing storage areas, register contents, current condition code and the address of the instruction being traced. Before execution of a SVC 0 the CCW chain is printed and after execution the actual record read or written. The control card specifies the address range of the instructions to be printed out, how many instructions are to be printed, and allows branch-only tracing. Multiphase programs may be traced and snapshots of core may be obtained. The user program requires no modification to run under Trace control.

PROGRAMMING SYSTEMS - Operates under DOS or TOS.

MINIMUM SYSTEM REQUIREMENTS - The minimum required by DOS or TOS. Trace occupies 1,820 bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D042003

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.2.004
SPRINT - SELECTIVE PRINTOUT RAPID INSTRUCTION TRACE

AUTHOR: B. C. Hegbin

DIRECT TECHNICAL INQUIRIES TO:
B. C. Hegbin
British Shoe Corporation
Sunningdale Road
Leicester, England

*** G - - - - - - - - - ***

DESCRIPTION - SPRINT is designed to trace any user program printing out instructions in a selected class, to facilitate testing and debugging. SPRINT was compiled and tested on a S/360 Model 50 using O/S Version 13. Any O/S program may be traced by SPRINT by loading users program from a library. Printout is in BAL, with data before and after execution. High and low addresses relative to users entry point are specified to suppress unwanted printout. Features include - Suppression of program checks up to a given number; optional relativisation of instruction and operand addresses to users entry point; optional branch-only printout; flagging of important instructions; data for SS-type instructions as up to 12 bytes in hex and EBCDIC; extended mnemonics and SVC-type macro-names.

PROGRAMMING SYSTEMS - Programming language - OS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360. (SPRINT occupies 3000-4500 bytes, depending on assembly options).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D042004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.2.006
A SERIES OF DIAGNOSTIC AIDS FOR OS/360, FORTRAN, COBOL AND PL/I USERS

AUTHOR: E. H. Somerfield

DIRECT TECHNICAL INQUIRIES TO:
E. H. Somerfield
IBM Corporation
D/818, B/906-14
Hopewell Junction, N.Y. 12533

*** N - - 02.0 04.1 - - - - - ***

DESCRIPTION - Often a programmer cannot begin debugging a program until he has gone thru many unproductive operations, such as finding the relative address of an interrupt within a program. The OS/360 Diagnostic Aid was developed to eliminate this unproductive work and to lead both the novice and the experienced programmer directly to the source of an error. It does so by producing an output in plain, easily understood English, not in programming terms.

PROGRAMMING SYSTEMS - Source language - OS/360 Assembler Language; uses OS/360, MFT/MVT.

MINIMUM SYSTEM REQUIREMENTS - Model 40 with direct access devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D042006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.2.007
PROGRAM TO AID IN OPTIMIZING COMPUTE BOUND JOBS BY INDICATING THE MAJOR PROCESSING LOOPS

AUTHORS: S. Averbach F. Fishman

DIRECT TECHNICAL INQUIRIES TO:
S. Averbach
IBM Corporation
330 Madison Avenue
New York, New York 10017

*** N - - 00.0 - - - - - - ***

DESCRIPTION - This package of two programs and a sort is used to locate the central loops in a compute bound program. With this knowledge it is usually possible to recode these central loops and substantially reduce program execution time. The first program runs in foreground partition one of a DOS MP system. It uses the interval timer to sample the old external PSW at 0.1 second intervals. The contents of the old external PSW is copied from main storage location 28 and written onto a sequential disk file. This is, of course, the address of the next instruction to be executed in the background partition. This program is self-relocatable. Source language is Assembler. The file of instruction counter locations is sorted using the DOS sort. The sorted location counter file is edited by the second program in the package.

PROGRAMMING SYSTEMS - This program is written in DOS COBOL E; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required to run DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D042007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.3.001
S/360 TAPE TEST FILE GENERATOR

AUTHOR: P. Verbrugge

DIRECT TECHNICAL INQUIRIES TO:
P. Verbrugge
IBM Corp.
1400 Baltimore
Kansas City, Mo. 64141

*** N - TFG 00.3 - - - - - - ***

DESCRIPTION - The S/360 Tape File Generator is a card-to-tape type program written in IBM TOS/DOS Assembler Language. The program builds blocks of up to 5000 bytes in length and in any combination of data formats; character, hex, packed and binary. Labeled or unlabeled files of fixed, variable, or undefined records, blocked or unblocked can be built.

PROGRAMMING SYSTEMS - Written to operate under the Tape or Disk Operating Systems.

MINIMUM SYSTEM REQUIREMENTS - 32K storage, Decimal Arithmetic, 2400 Tape Drives, 1403 Printer, 2540 Card Reader Punch and 1052 Printer/Keyboard.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D043001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.3.002
ADVANCED LIFE INFORMATION SYSTEM MASTER RECORD UTILITY PROGRAM

AUTHOR: J. S. Whitney, Jr.

DIRECT TECHNICAL INQUIRIES TO:
J. S. Whitney, Jr.
IBM Corp.
P. O. Box 2900
Jacksonville, Fla. 32203

*** N - 0001A 00.3 06.6 - - - - - ***

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DESCRIPTION - This program is intended as a conversion aid for the Advanced Life Information System. Any field in the ALIS master record (as it exists on tape) may be changed by use of this program with the IBM Disk Operating System. The user specifies the following information in a transaction card for each field to be changed- policy number, trailer ID, trailer number (if more than one trailer exists on the master record with the same ID), field position within the trailer, and field contents before and after the change. The "BEFORE" field in the transaction must compare equal to the old master field before a change will take place. A register is produced which shows field contents both before and after a change, as well as an error code for those changes which could not be made.

PROGRAMMING SYSTEMS - Source is S/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Minimum configuration for Disk Operating System, plus two tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D043002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.3.003
GENERALIZED OS/360 ASSEMBLER LANGUAGE INPUT/OUTPUT SUBPROGRAM FOR USE WITH ASSEMBLER LANGUAGE AND OR PL/I

AUTHORS: Mr. J.A. Keller H. Ludlam
S. Nyarady B. Young
N. Kittredge

DIRECT TECHNICAL INQUIRIES TO:
Mr. J.A. Keller
IBM Corp.
112 E. Post Rd.
White Plains, N.Y.

*** N - - 03.4 - - - - - - ***

DESCRIPTION - An OS/360 input/output sub-program capable of performing many commonly required I/O operations on sequential, index-sequential and partitioned data sets. The I/O package supports user modules written in Assembler Language, PL/1 or a bi-lingual environment where both BAL and PL/1 user modules are present. Any number of data sets can be managed in a single execution. User programs invoke the I/O subsystem by means of call statements and parameter lists. I/O base modules are combined with user programs through linkage editor processing.

FEATURES -
- Simplifies and standardizes I/O programming for the application programmer.
- Provides a common interface between all user programs and the user data base.
- Provides error editing and error reporting facilities.
- Provides an ISAM journal and unprocess capability.
- Performs utility functions such as record count accumulation and display, DCB format dumps, ESCB format dumps, CVT format dumps.

PROGRAMMING SYSTEMS - Written in Assembler Language and uses S/360 OS.

MINIMUM SYSTEM REQUIREMENTS - That for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up
MACHINE READABLE - Appropriate Material Delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D043003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.3.004
TEST DATA SET GENERATOR PROGRAM - OS/360

AUTHOR: Mr. J.A. Keller

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
112 E. Post Rd.
White Plains, N.Y. 10601

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*** N - - - - - - - - - - ***

DESCRIPTION - OS/360 Data Set Generator Program converts input control cards and data to sequential data set(s). Output record formats can be F, FB, V, VB. Input to the DSG can be cards, card images on tape, DASD or PDS members. Translated output DS(s) can reside on tape, DASD, cards or any combination thereof. A maximum of 99 data sets can be generated in a single execution. Maximum length of each output logical record is 4095 bytes. DSG produces binary, packed decimal, EBCDIC, hexadecimal, fill, binary incrementing/decrementing, packed decimal incrementing/decrementing fields in any combination or order. All output records are automatically listed in a numbered character/HEX 4-line format as they are being generated. A "NOLIST", option allows supression of the data set print out. DSG has the capability of repeating entire records any number of times or repeating selected fields for any duration. Error checking and diagnostic routines fully document all errors to include type of error, card number in error, field number in error and appropriate corrective action. DSG is particularly easy to use as there is only one type of control card and input data is coded in free format positional independent notation.

PROGRAMMING SYSTEMS - Written in OS/360 Basic Assembler Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - OS/360 system with the Decimal Arithmetic feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D043004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.4.003 *M
SETBTF - A DIAGNOSTIC ROUTINE FOR OS/360 FORTRAN

AUTHORS: W.P. Gewin J.G. Rogers

DIRECT TECHNICAL INQUIRIES TO:
W.P. Gewin
630 Ellis St.
Augusta, Ga. 30901

*** N - - - - - - - - - - ***

DESCRIPTION - This subroutine is for use with OS/360 FORTRAN object programs. It provides helpful diagnostic information when the FORTRAN library routines detect program errors. The routine provides-

- "IHCMMM" error code (with English description when the error was detected by IBCOM or FIOCS).
- Current data set reference numbers.
- Back trace of calls with ISN's, subroutine names and contents of registers.

PROGRAMMING SYSTEMS - The package is written mainly in OS/360 Assembler Language with a FORTRAN coded routine for message outputting.

MINIMUM SYSTEM REQUIREMENTS - Any machine supporting OS/360 FORTRAN E.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D044003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.4.005 *M
GBUG - A GRAPHIC TOOL FOR ON-LINE PROGRAM DEBUGGING

AUTHOR: Mr. L. Zimmerman

DIRECT TECHNICAL INQUIRIES TO:
Mr. L. Zimmerman
IBM Corp.
CPC NO. 120
Kingston, N.Y. 12401

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*** N - - 00.6 08.7 - - - - - ***

DESCRIPTION - This program allows on-line debugging to be done via an IBM 2250 Display Unit. Debugging options are displayed on the CRT and may be selected for use with the light pen. Options include (1) Display and alteration of selected memory locations (in both decimal and hexadecimal) and of general and floating point registers; (2) Memory dumps, with CRT output; (3) Addressing relative to the users program origin; (4) Breakpoints; (5) Automatic interception of program exceptions as they occur, with appropriate diagnostics displayed; (6) Ability to return control to the users program at any point. Use of a display provides a considerable advantage over conventional terminals in operator convenience and especially in speed of requests and replies.

PROGRAMMING SYSTEMS - GBUG operates under OS/360 control (any release supporting Express Graphics).

MINIMUM SYSTEM REQUIREMENTS - 4K IBM 2250 with character generator, alpha/numeric keyboard and light pen.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D044005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-04.4.006
HIGH-WATER MARK

AUTHOR: Mr. R.C. Babbitt

DIRECT TECHNICAL INQUIRIES TO:
Mr. R.C. Babbitt
IBM Corp.
1720 Zollinger Rd.
Columbus, Ohio 43221

*** N - - 10.2 - - - - - - ***

DESCRIPTION - High-Water-Mark is a program designed to determine the largest size of a problem program running under the S/360 Operating System with or without Option 2. It becomes part of the control program nucleus in the form of a Type 1 SVC. Its function is to intercept each GETMAIN request, calculate the size of the partition, problem program, and largest free area; and when the problem program is at its largest, store the information in the nucleus. A service routine, such as the accounting routine, must be invoked in order to print the information. It will be approximately seven hundred bytes in size.

PROGRAMMING SYSTEMS - Runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D044006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.4.007 *M
TESTMISP - A TESTING AID FOR INSTALLING MEDICAL INFORMATION SYSTEM PROGRAMS

AUTHOR: L.G. Richards

DIRECT TECHNICAL INQUIRIES TO:
Miss M. F. Withers
IBM Corp.
Garden State Parkway
Exit 136
Cranford, N.J. 07016

*** N - - 04.2 05.0 - - - - - ***

DESCRIPTION - TESTMISP is a System/360 DOS program which allows an Assembler Language programmer to test application programs to be used in a hospital information system utilizing the Medical Information System Programs (MISP). A working knowledge of the functions and requirements of MISP is a prerequisite for the use of TESTMISP. Information concerning MISP is available through your IBM marketing

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representative. This program simulates MISP operation by performing the same functions, simulating these functions and/or printing a trace of the functions indicated in the application program. Full core and disk storage capacity and the terminals required in an operational hospital information system are not required in order to utilize TESTMISP. If additional core storage is available, however, the user may continue tc test programs in the background partition concurrent with "LIVE" operation after MISP is installed.

PROGRAMMING SYSTEMS - Utilizes DCS/360.

MINIMUM SYSTEM REQUIREMENTS - TESTMISP will operate in a System/360. Model E30 (assuming an 8K maximum supervisor) or in a 24K background partition in a 128K MISP environment. No terminals are required and only two disk drives are needed one for system residence and the other for data. A printer, card reader and card punch complete the minimum requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D044007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.4.008
CONTROL SECTION CROSS-REFERENCE AND LINK EDIT EDITOR

AUTHOR: Q. J. Maltey

DIRECT TECHNICAL INQUIRIES TO:
Q. J. Maltey
North American Life Assce. Co.
105 Adelaide Street
West Toronto 1, Ontario

*** N - CXR - - - - - - - ***

DESCRIPTION - These two Assembly programs may prove useful in analysis and debugging work with respect to large and complex planned overlay modules. The Control Section Cross Reference Program (CSREFG) analyzes a single load module from a load library and data from amender cards. It prints a cross-reference list of the control sections and writes a tape for use by the Link Edit Editor.

The Link Edit Editor Program (LKEDEDIT) analyzes the tape produced by CSXREFG and a trial deck of Linkage Editor data cards (the OVERLAY and INSERT cards are used to build the test overlay tree structure). Various lists are produced, the most vital being the segment cross-reference list. The segment cross-reference list points out any exclusive calls and exclusive usages which could obliterate normal return paths (of any length) in the segment calling sequence of planned overlay program.

PROGRAMMING SYSTEMS - Programming language - Assembler Language. Operating system required - Full OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 or better with the decimal feature, at least 128K core, and a system reader, a system printer, one tape drive (disk could be used instead), and it was assumed that the load library is one 2311 disk.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D044008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-04.4.009
DOS I/O BOUND ANALYZER

AUTHOR: P. P. Uhrowczik

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
19264 Ludlow Street
Northridge, California 91324

CONTINUED FROM PRIOR COLUMN

*** N - - 02.0 - - - - - - - ***

DESCRIPTION - This program will provide a complete analysis of the amount of time a given program is forced to wait for the completion of an I/O operation. (The output is given in seconds and percentages relative to the total time of the jcb on the console typewriter, per each device and channel. It may be used for precise evaluation of device and channel utilization, blocking and overlapping advantages, multiprogramming capabilities, etc.

PROGRAMMING SYSTEMS - Source language is Assembler Language; uses DOS/360, multiprogramming, and at least Release #17.

MINIMUM SYSTEM REQUIREMENTS - The program requires the Interval Timer feature and a 1052 Typewriter. 4K of storage is required for this program. It must be run in F1 partition and the program to be analyzed in BG partition. It does not slow the execution of the BG program.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D044009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-04.6.001
A PROGRAM FOR GRAPHIC ON-LINE DEBUGGING ON AN IBM 2250 DISPLAY

AUTHOR: G. M. Stabler

DIRECT TECHNICAL INQUIRIES TO:
G. M. Stabler
Brown University Computing Lab.
Providence, R.I. 02906

*** N - - 04.1 04.4 - - - - - ***

DESCRIPTION - The Graphic On-Line Debugging program (GOLDBUG) is a program designed as an aid to on-line debugging, specifically with regard to programs involving interactive graphics. The basic capabilities offered by GOLDBUG are: (1) Examination of core and the registers. Core is displayed in blocks of 768 bytes in a dump-like format. The area displayed can be changed by scrolling, address computation (including relative addressing), or "pointer chasing", using the light pen to indicate the word containing the next address to be displayed. (2) The ability to patch any part of core. (3) The option of producing hard copy of any part of core currently displayed, or requesting a full-task snap. (4) Fixed and floating point conversion. The word (or words, for double precision) to be translated is indicated with the light pen. (5) The ability to call any in-core subroutine from GOLDBUG with register contents that can be specified by the programmer. GOLDBUG can be used as an attention routine or can be called from an appropriate SPIE routine. In the latter case, it is possible to display all the registers and the PSW as they were when the interrupt occured.

PROGRAMMING SYSTEMS - Written in Assembly Language using GPS.

MINIMUM SYSTEM REQUIREMENTS - An S/360 Model 40 or higher and equipped with a 2250 Model 1 or 3 scope.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D046001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-05.0.001
S/360 DOS FORTRAN PHASE OVERLAY SUBROUTINE

AUTHOR: Mr. B.L. Bryan

DIRECT TECHNICAL INQUIRIES TO:
Mr. B.L. Bryan
IBM Corp.
747 Northern Ave.
Hagerstown, Md. 21740

*** N - - - - - - - - - ***

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DESCRIPTION - The Phase Overlay Subroutine permits a System/360 Basic FORTRAN IV (Z level) program to be divided into phases or segments. The subroutine will retrieve a called program phase from disk for execution. This technique will allow a FORTRAN program much larger than available core to be executed.

PROGRAMMING SYSTEMS - Written in FORTRAN and uses DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTICNAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D050001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.0.002
S/360 DOS MACHINE UTILIZATION REPORTING SYSTEM

AUTHORS: R.J. Chernis M.A. Dipasquale

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
400 Wyman St.
Waltham, Mass. 02154

*** N - - 01.0 - - - - - - ***

DESCRIPTION - The S/360 DOS Machine Utilization System is a series of programs that prepares two operations reports. The first is a listing of time of day and elapsed time for all jobs run and includes a line summarizing idle time between jobs. The second is a sorted list of jobs run by date in job name sequence. The system includes programs to initially format the disk logging area, to actually log the data, and to run both listings. Sample job control cards to run the entire system are listed.

PROGRAMMING SYSTEMS - Written in DOS and the source language for the log program is Assembler. All other programs are in PL/I. All programs are distributed in source form so that the user can tailor as necessary to his configuration.

MINIMUM SYSTEM REQUIREMENTS - 32K Model 30 with Interval Timer using DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D050002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.0.003 *N
CS MASTER SCHEDULER INITIALIZATION IMPROVEMENTS

AUTHOR: Seymour J. Metz

DIRECT TECHNICAL INQUIRIES TO:
Seymour J. Metz
Applied Data Research, Inc.
2425 Wilson Blvd.
Arlington, Virginia 22201

*** N - - - - - - - - - ***

DESCRIPTION - These modifications to the MFT and MVT Master Scheduler Initialization modules cause improved generation of automatic commands. In addition, messages are generated prompting the operator, in situations where he would otherwise be waiting for a wait state. The modifications are for OS/360 Release 17 or later.

PROGRAMMING SYSTEMS - Written in S/360, OS ALP; operates under control of OS/360 MFT or MVT.

MINIMUM SYSTEM REQUIREMENTS - These modifications require a level G (128K) or larger CPU for MFT, and a level H (256K) or larger CPU for MVT. They have been tested for both MFT and MVT on a 360/40H.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

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ORDERING INFORMATION: PROGRAM NUMBER 360D050003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.1.001
REMOTE ACCESS COMPUTING SYSTEM

AUTHORS: Mr. T. McDermott Jan Sisk

DIRECT TECHNICAL INQUIRIES TO:
Mr. Frank Yee
IBM Corp.
112 E. Post Rd.
White Plains, N.Y.

*** N - - 03.4 06.3 - - - - - ***

DESCRIPTION - RACS is a program to allow the S/360 Model 30, 40, and 50 to compile and execute concurrently, in a time-shared, time-sliced mode of operation, BPS FORTRAN IV and BAP jobs from up to 14 remote 1050 and the online card reader and printer. Input to RACS is according to rules for preparing input for BPS FORTRAN IV and BAP as outlined in IBM publication SRL forms numbered C28-6504 and C28-6503, respectively. The Compiler and Assembler that is an inherent part of the system is an early version of an IBM compiler and assembler and does not represent the latest version of those Systems. BPS FORTRAN corrections have been inserted up to version 2 of that System. It has extensive modifications to make it disk resident.

This system is being made available to satisfy the need for S/360 remote computing and time-sharing software. Additionally, its use as a disk-oriented processor and source of 1050-2702 coding will make it valuable to field installations.

PROGRAMMING SYSTEMS - Written in BPS FORTRAN.

MINIMUM SYSTEMS REQUIREMENTS - S/360 Model 30, 40, 50. 64K and one 2311 Disk Drive and a 2702.

BASIC PROGRAM PACKAGE
DOCUMENTATION - SRL forms numbered C28-6504 and C28-6503
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/1600	29	02
		MT 9/800	28	02
		MT 7DC/800	26	02
OPTIONAL	none	none		none

360D-05.1.003
CSP/360 (COMPATIBILITY SUPPORT PACKAGE)

AUTHORS: M.P. Oravec A. Malay

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
110 W 21st St.
Norfolk, Va. 23517

*** N - - 03.4 - - - - - - ***

DESCRIPTION - CSP/360 (Compatibility Support Package) is a set of programs interfacing the 1401/1440/1460 Compatibility feature on the Model 30. The CSP/360 package provides means by which 1400 programs can be executed in Compatibility Mode on the Model 30 in a stacked job environment intermixing 1400 programs and normal 360 programs in the input job stream. Another provision is the standardized interface to the CSP supervisor which allows user attachment of custom routines for device simulation or substitution using the program mode switch. Device routines for 1402 are a part of the supervisor as presented. Generalized device routines for magnetic tape, and 1405 simulation are also provided.

PROGRAMMING SYSTEMS - Programs function within the framework of BPS - BOS stand alone.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30 with 1400 I/O compatibility features, PMS and Decimal Arithmetic feature. Other requirements are those needed to satisfy BPS or BOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.1.004
LINCOLN LABORATORY MULTI-PROGRAMMING SUPERVISOR (LIMPS)

AUTHORS: Mr. J. Winett Mr. F. Belvin

DIRECT TECHNICAL INQUIRIES TO:
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MIT Lincoln Laboratory
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Lexington, Mass. 02173

*** S LL MPS1 05.2 00.1 08.8 07.6 - - - ***

DESCRIPTION - A supervisor program has been written for the IBM System/360 which allows the multiprogramming of several jobs, each with its own input-output requirements. A job program operates in problem state, and realizes all of its input/output demands through supervisor calls. I/O operations of one job are overlapped with those of other jobs, and can also be overlapped within a single job. Each job is written completely independent of all other jobs. A job is initiated by a request typed on the console typewriter and runs, with frequent I/O waits, until it calls for its own termination, or is terminated by the operator via the console typewriter. During the operation of the supervisor, a job can be initiated, can terminate, and can be re-initiated as often as desired. All jobs reside in core together with the supervisor. To minimize space, buffers are assigned at the initiation of a job and are released upon termination.

Job programs may be written as re-entrant, whereby a single copy of a job program can be active for more than one task. Re-entrant jobs, thus, have different buffer areas for each distinct initiation. When a job is started, the operator specifies the I/O devices required (e.g., a particular printer and tape unit for a print job), and any initial parameters desired (e.g., tape density setting, instructions to skip to a specified listing, instructions to stop after a tape mark, and so forth). The job is then started if the requisite I/O devices and buffers are available. The I/O devices remain assigned to that job until it terminates. However, at any time a job can issue messages to the operator via the console typewriter. Multi-programming is achieved by central handling of I/O, and by the fact that the jobs run are, in every case, I/O bound. Thus, while a job is waiting on I/O, other jobs can make use of the Central Processor. When an I/O device has completed its operation, the job which started the I/O operation, through a supervisor call, is permitted to continue. No standard device error-recovery routines are built into the supervisor, but a family of subroutines is developing which jobs can call upon to provide error recovery. Unit check and unit exception indications are provided to the job at the time the job executes the supervisor call to wait on a device.

The conventions which a job program must follow deal with supervisor call calling sequences since it cannot use privileged instructions. A job controls its input/output by issuing a supervisor call to execute a channel command. (command chaining, data chaining, and ticing are allowed, but PCI's are prohibited). If certain suggestions are followed in the writing of channel programs, the systems efficiency is improved, however, the supervisor does no policing of channel programs. Errors committed in the running of a job cause the job to be terminated with a job dump. Storage protection is not used and thus one cannot guard against all errors, hence, all job programs should be debugged before they are included in the system. our library of jobs includes-

1. System Jobs - to list the jobs in the system, to list the active jobs, i.e., tasks or to terminate an active job.
2. Tape Move Jobs - skips files or records either forward or backward as desired.
3. Prestore Job - places BCD or binary card images onto tape with standard look-ahead characters.
4. Print Job - reads, deblocks, and prints a BCD tape with FORTRAN carriage control characters.
5. Punch Job - reads, deblocks, and punches card images from tape.
6. Tape Copy and Compare job - copies and compares a mixed mode tape of any density.
7. Tape Dump Jobs - dumps a 7-track tape in BCD or OCTAL.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 40 Configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051004

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-05.1.007 *M
HOUSTON AUTOMATIC SPOOLING PRIORITY SYSTEM

AUTHORS: Mr. T. H. Simpson Mr. R.P. Crabtree
Mr. W. F. Borgers Mr. C. H. Long
Mr. W. M. Conner

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
1322 Space Park Dr.
Houston, Texas 77058

*** N - - - - - - - - - ***

DESCRIPTION - The Houston Automatic Spooling Package is an automatic SYSIN/SYSOUT/SYSPUNCH spooling package with the ability to operate an essentially unlimited number of peripheral devices concurrently in conjunction with OS/360 processing utilizing a variable number of 2311 and/or 2314 Direct-Access modules for intermediate storage. HASP operates with no modifications to OS/360. Any option 2 installation may use HASP by simply adding it to his program library and adding one user SVC routine to OS/360. Hasp may then be invoked (optionally) at any time by standard partition loading procedures. HASP has been designed to operate as independently as possible of OS/360 release levels and, excluding major design changes, should adapt to new releases of the Operating System with no modifications.

PROGRAMMING SYSTEMS - The program source is in OS/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Less than 27K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.1.008
MULTI-COMPATIBILITY CONTROL (MCC-II) FOR 1401 COMPATIBILITY ON SYSTEM/360 MODEL 30

AUTHOR: Mr. R. E. Vlaha

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
15th Floor
100 South Wacker Drive
Chicago, Ill. 60606

*** N - - 05.2 - - - - - - ***

DESCRIPTION - Multi-Compatibility control II is a System/360 Model 30 multiprogramming monitor which controls the operation of two 1401 programs. MCC-II is designed to control the simultaneous running of an 8 and 16K 1401 single-phase program, but can easily be modified to accommodate different sized partitions. The loading of 1401 programs is from the 2540 Card Reader. This program gives the illusion of two independent central processing units by not halting both programs unless encountering I/O errors which are totally handled by 1401 compatibility.

PROGRAMMING SYSTEMS - Multi-Compatibility Control is written in S/360 Assembly Language with 8K BOS Support.

MINIMUM SYSTEM REQUIREMENTS - This version of MCC is written in 8K BOS Support and requires 7040 bytes of storage. The use of the monitor requires the minimum of a 16K System/360 Model 30 with the 1401 Compatibility Feature, Program Mode Switch, 1052 Console Typewriter, and 2540 Card Reader. Either of the required I/O devices can be utilized by the 1401 programs. The remainder of the 1401 programs. MCC-II does not require the re-assembly or patching of existing 1401 programs. Non-stop halt routines and a S/360 I/O Scheduler have maximized system thruput. Operational capabilities include the logging of operator actions such as halts, the setting and displaying of I/O and sense switches, and the allocation of I/O devices. Job accounting routines are included for use with the Interval Timer. These and other features have enabled

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system utilization to nudge the 195 per cent mark.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.1.009
MODEL 40 1401 EMULATOR AND DOS IN STACKED JOB ENVIRONMENT

AUTHOR: R. L. Standfast

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
555 Madison Ave.
New York, N.Y. 10022

*** N - - 01.5 - - - - - - ***

DESCRIPTION - This program is designed to give the S/360 Model 40 user, converting from 1401/1460, the advantages of stacked job processing. Two cylinders of the DOS SYSRES pack (2311) are used. 1401 programs must be preceeded and followed by standard DOS job control cards. Emulator operation is otherwise unaltered except for an "E" control code which returns control to DOS and with an EOJ MACRO. A roll-out roll-in technique is used that could be adapted to other emulator and operating system combinations.

PROGRAMMING SYSTEMS - The source language is S/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Machine requirements are a 64K Model 40 plus the required I/O for DOS and the Model 40 1401 Emulator.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.1.011
REMOTE JOB ENTRY FOR FOREGROUND (DROS)

AUTHORS: J. E. Steely J. C. Carney
J. O. Mills Charlotte P. Sedam
R. L. Rustad

DIRECT TECHNICAL INQUIRIES TO:
R. L. Rustad
IBM Corporation
P.O. Box 2491
Norfolk, Va. 23510

*** N - - - - - - - - - ***

DESCRIPTION - DROS operates under DOS in full multiprogramming mode, handling switched and leased 1050 and 1130 systems for Remote Job Entry/Output. It is the only non-dedicated Remote Job Entry system which can be run on a 64K system. All DOS facilities are supported at the terminal; including all language processors. Macros have been included in the system to facilitate the DROS system generation which can be tailored to user's specifications.

PROGRAMMING SYSTEMS - Written in S/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - A System/360 (minimum of 64K) Model 30 or larger, using one 2311 disk dedicated to teleprocessing, 1050's, 2701/2702.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none

CONTINUED FROM PRIOR COLUMN

OPTIONAL	none	none	none

360D-05.1.012
RACS/44 - REMOTE ACCESS TIME SHARING

AUTHORS: K. Wittenberg Mr. B. Dryfoos
Mr. B. Mihaltse

DIRECT TECHNICAL INQUIRIES TO:
Mr. M. Tuchman
American Can Co.
100 Park Ave.
New York, N.Y. 10017

*** S CAN RACS1 - - - - - - - ***

DESCRIPTION - The RACS/44 System is designed to offer the user of the IBM S/360 Model 44 a remote access, time-sharing capability. The program is a modification of the IBM supported Type II RACS program 360A-CX-17X. The distributed system consists of this RACS system altered to allow execution on the Model 44. However, system generation must still be accomplished on a S/360 Model 30, 40, or 50.

FEATURES -
1. Basic FORTRAN and BAL Language capabilities.
2. 1050 and 2260 Terminal Support.
3. 2540 and 1403 access at batch terminal.
4. Library save capability.
5. Conversational I/O for terminal user.

PROGRAMMING SYSTEMS - Source language is S/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS -
1. 2044 CPU with 64K and one high-speed multiplexor.
2. 2-2311 Disk Drives connected to high-speed multiplexor.
3. 2701 or 2702 Transmission Control Unit (64K supports up to 4-1050 Terminals with 2701, up to 10 with 2702).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-05.1.013 *M
MULTIPLE TERMINAL MONITOR TASK FOR 2260

AUTHORS: D. H. McNeil W. O. Evans
J. H. Botterill G. F. Heyne

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation, Dept. 405, Bldg. 020-2
Highway 52 and N.W. 37 Street
Rochester, Minn. 55901

*** N - - 06.7 00.6 08.7 - - - - ***

DESCRIPTION - The Multiple Terminal Monitor Task for 2260 is a program which supplies most of the computing services of OS/360 at a 2260 Display Terminal. It includes supplementary services which allow card image editing, retrieval and display of on-line data, background job initiation under terminal control, and resource management to insure the integrity of each terminals activities and data. By providing immediate access to the range of programs and data in an OS/360 installation, Multiple Terminal Monitor task for 2260 forms a basis from which a wide variety of terminal applications can be served.

PROGRAMMING SYSTEMS - Written in OS/360 Macro Assembler Language; Operates under OS/360 (through Release 17).

MINIMUM SYSTEM REQUIREMENTS - OS/360 MVT with Basic Graphics Services and ISAM... Locally attached 2260 Displays having 960 character buffer, Line Addressing and Non-Destructive Cursor features... Memory region of 120K to support 8 2260's... Shared use of the direct access space in the installation... One special Type 3 SVC in SYS1.SVCLIB.
... One special Type 1 SVC to support conversation between 2260's and background jobs.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051013

	PROGRAM NUMBER	DISTRIBUTION MEDIUM	USER VOLUME

CONTINUED FROM PRIOR PAGE

	EXTENSION	TYPE	CODE	REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-05.1.014 *M
HOUSTON AUTOMATIC SPOOLING PRIORITY SYSTEM - II

AUTHORS: R.P. Crabtree R.C. Ray R.E. Hitt

DIRECT TECHNICAL INQUIRIES TO:
T. H. Simpson
IBM Corporation
11141 Georgia Avenue
Wheaton, Maryland 20902

*** N - - 03.4 05.2 - - - - - ***

DESCRIPTION - The HASP system is an automatic SYSIN/SYSOUT/SYSPUNCH spooling program with the ability to operate an essentially unlimited number of peripheral devices (including highspeed remote batch terminals) concurrently in conjunction with OS/360 processing. A variable number of 2311 and/or 2314 direct access modules are utilized for intermediate storage. Because of the specialized, singular use of resources available to HASP, very efficient algorithms have been employed to optimize function and performance. Any standard OS/360 job can be processed under a system utilizing HASP with no changes to the deck, and can make full use of the programming capability and flexibility offered by OS/360. HASP will operate inter-changeably with either the MFT or MVT options of OS/360 Rel. 15/16 or 17, but has been designed to be as release independent as possible to permit adaptation to future operating system releases. No modifications are required to OS/360. HASP can be utilized on any System/360 capable of supporting either of the aforementioned options of the operating system.

PROGRAMMING SYSTEMS - Programming language - Source - OS/360 Assembler Language. Operating system required is OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360. (36K).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.1.015
MULTITASKING MONITOR

AUTHOR: A. B. Nestiuk

DIRECT TECHNICAL INQUIRIES TO:
A. B. Nestiuk
1033 N. Francisco
Chicago, Illinois 606022

*** N - - 00.1 - - - - - - ***

DESCRIPTION - The Multitasking Monitor is designed to operate under DOS with the Asynchronous Processing and WAITM features. It will handle multitasking of non-related user programs with little or no reprogramming.

PROGRAMMING SYSTEMS - The program is written in BAL.

MINIMUM SYSTEM REQUIREMENTS - At least 10K core is required, since the Monitor must run in a batched environment. Requires a console typewriter to operate.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.1.016 *M
CONVERSATIONAL REMOTE BATCH ENTRY (CRBE)

AUTHOR: H. Cocchi J.M. Dively
W.C. Goodlett D.A. Hubbard
D.C. Schuman

DIRECT TECHNICAL INQUIRIES TO:
E.J. Christiansen
IBM, Dept. 776, PSMD
2651 Strang Blvd. (Triangle)
Yorktown Heights, New York 10598

*** N - - - - - - - - - ***

DESCRIPTION - Conversational Remote Batch Entry permits the remote user to conversationally create input for OS/360 processing. Once processed the results may be examined at the remote terminal. System modification-(1) Module IGC0503D is renamed to IGC9503D and replaced by a module which routes the SEND command to CRB1503D or exits to IGC9503D; (2) The name verification table IEEVLNKT is modified to include the names CRBEGEGN and CRBEWTR. This permits the use of START command. Future release of OS/360 may require changes to these modules.

PROGRAMMING SYSTEMS - The programming language is OS/360 Assembler (F).

MINIMUM SYSTEM REQUIREMENTS - (1) MFT-II Rel. 15/16 3640H; or MVT Rel. 15/16 3650I and 2701, 2702, or 2703 with sufficient features and lines to support--1050 leased or dial (keyboard); 2740 leased or dial, code-EBCDIC, optional-checking, station control, transmit control; 2741 leased or dial (generate as 2740 basic), code-EBCDIC, BCD, or correspondence, optional-interrupt feature; 2260 leased (any model), require-line addressing, alphameric keyboard; (3) DASD space on 2311 or 2314 for system and user libraries and workfiles.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.1.018 *N
BAYLOR EXECUTIVE SYSTEM FOR TELEPROCESSING (BEST)

AUTHORS: W. Hobbs Jane McBride

DIRECT TECHNICAL INQUIRIES TO:
W. Hobbs
Computer Scinece Program
Baylor College of Medicine - 1200 Moursund Ave.
Houston, Texas 77025

*** S BAY - 03.4 - - - - - - ***

DESCRIPTION - The Baylor Executive System for Teleprocessing (BEST) is a remote access system which supports interactive execution of multiple jobs from low speed terminals while the usual batch job streams are operational. High level language interfaces are included with the system so that a job which converses with a terminal may be written in PL/I, COBOL or FORTRAN, as well as Assembler Language. All jobs in the system are storage protected and can be time-sliced by the BEST Monitor.

PROGRAMMING SYSTEMS - The system is written in Assembler Language to run under OS/360.

MINIMUM SYSTEM REQUIREMENTS - BEST requires a System/360 with a minimum of 256K core storage positions. It supports the following terminal types: 1050, 2740, 2260 Local, 2260 Remote, and Teletype Mod 33/35.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.1.019
O.S./M.I.S.P. VERSION 1.1

AUTHOR: Ed Belcher

DIRECT TECHNICAL INQUIRIES TO:
Bob Sheridan
Service Computation Center
The University of Texas Medical Branch
Galveston, Texas 77550

*** N - - 06.3 06.7 - - - - - ***

DESCRIPTION - The OS/MISP routines are designed to extend the use of the MISP package to the larger hospital that utilizes OS/360. This package is a conversion of the DOS/MISP Version 1.1 (360A-UH-08L) package that is released by IBM as Type II. Externally the two packages are identical, and programs which operate using DOS/MISP will operate under OS/MISP with a recompilation. Internally the package was converted such that all the facilities of OS/360 are utilized. This program handles all the line control functions for the 1050/1092/1093 Terminal, all the data management for the Teleprocessing system and users, all the application program initiation and termination functions, plus many hospital oriented macros to assist the application programmers. The documentation for DOS/MISP Version 1.1 (360A-UH-08L) is used with OS/MISP package and additional documentation is given which discusses the OS/MISP generation process plus detail changes made to the system. Documentation for DOS/MISP Version 1.1 should be ordered in conjunction with this program.

PROGRAMMING SYSTEM - Written in Assembler language F.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D051019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-05.1.020 *N
PITT TIME SHARING SYSTEM AND ASSOCIATED LANGUAGE PROCESSORS

AUTHOR: G.F. Badger, Jr.

DIRECT TECHNICAL INQUIRIES TO:
G.F. Badger, Jr.
Time Sharing Project
Computer Center, University of Pittsburg
Pittsburg, Pennsylvania 15213

*** S PIT - 03.3 03.7 05.2 - - - - ***

DESCRIPTION - This system is a stand alone time sharing executive supporting a variety of terminals over telephone or private lines. It includes PIL, an interpretive language as well as ASSEMBLER, FORTRAN, and other language processors. It also includes an extensive data management system on a 2314 disk, batch processing background, and spooling. A future extension will support channel to channel attachment to an OS system. A users manual is available from the Book Center, University of Pittsburgh.

PROGRAMMING SYSTEMS - Written in OS Assembler language F.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D051020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

*N 360D-05.2.001
MODIFICATION TO IBM BOS/360 (8K-DISK)

AUTHORS: H. H. Rump D. A. Tuozzo
D. P. McInnis

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
1120 Connecticut Ave.
N.W. Washington, D.C. 20036

*** N - - 03.4 06.3 - - - - - ***

DESCRIPTION - These modifications to the IBM BOS/360 (8K-Disk) provide the ability to permit multiple foreground tasks to reside and operate concurrently with a background program. These resident tasks can include Teleprocessing support, (2701/2702/1050/2740) file-to-file spool, Autodin Adapter support or a timer interrupt support controlled program. Using the supplied general purpose foreground macros, unique user foreground programs can be written. The 2321 Data Cell is supported by Direct, Sequential and Indexed Sequential Access Methods.

PROGRAMMING SYSTEMS - Source language is S/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Machine configuration - System/360 Model 30 or larger. 16K minimum; 1052 Console Typewriter.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-05.2.002
FHNCLG/ONESTEP - A FORTRAN H PROGRAM FOR MULTIPLE COMPILE, LINK EDIT AND GO

AUTHOR: R. E. Hillblom

DIRECT TECHNICAL INQUIRIES TO:
R. E. Hillblom
IBM Corp.
3424 Wilshire Blvd.
Los Angeles, Calif. 90005

*** N - - 01.1 - - - - - - ***

DESCRIPTION - These programs provide increased OS/360 FORTRAN H performance by avoiding the use of the job scheduler between jobs and job steps.

PROGRAMMING SYSTEMS - These programs are intended for both production and demonstration environments. They are written in Assembly Language to invoke the FORTRAN Compiler, the linkage editor and the resultant load module.

MINIMUM SYSTEM REQUIREMENTS - Same as for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.2.003
MULTIPLE COMPATIBILITY CONTROL

AUTHOR: S. Francisco

DIRECT TECHNICAL INQUIRIES TO:
D. J. Skiba
IBM Corp.
112 E. Post Rd.
White Plains, N. Y.

*** N - - 05.1 11.1 - - - - - ***

DESCRIPTION - MCC, is a program which operates on a System/360 Model 30 to allow two 4K 1401 programs to share execution time in the CPU. This is accomplished by placing invalid (J) OP codes in the 1401 programs where an interlocking unit record operation would take place. The

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invalid OP code causes a switch from one program to the other. This allows the other program to execute during the normal mechanical transfer time of the first program which would interlock the first program during I/O bound executions. An advantage is gained when the programs being executed are unit-record I/O bound when operating under compatibility on the 360/30.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30, 16K, 1401 Compatibility, one 2400 series Tape Drive, PMS (Program Mode Switch) feature, one 2540, one 1403, 1052 Console.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.2.004
EXTRA LARGE COMPATIBILITY INITIALIZATION DECK EL-CID

AUTHOR: John J. Morrissee

DIRECT TECHNICAL INQUIRIES TO:
John J. Morrissee
IBM Corp.
2 Broadway
New York, N. Y. 10004

*** N - - 05.2 00.0 01.0 11.1 - - - ***

DESCRIPTION - EL CID is a S/360 program used to monitor 1401 programs run in Compatibility Mode. The program has 4 main features. First, it enables 1401 programs to be run in stacked-job, non-stop environment. This should help customers in making the transition between the single job atmosphere of the 1400 series and the operating system environment of the S/360. Second, the processing of job control cards to set sense switches and make tape drive assignments virtually eliminates the need for time consuming dialing and button pushing normally required with the CID deck. Third, complete documentation of operations is available via the IBM 1052 printer and keyboard. All job control cards are logged as well as any special comments to the operator, such as instructions to insert special forms in the printer. When a 1401 error stop condition is encountered, the stop code normally displayed in the main storage data register is printed along with the I, A, and B addresses where the error occurred. Control is then turned over to the operator who may type his response to the monitor. Fourth, frequently used utility programs and subroutines have been made core resident and callable via the 1052 thus saving time in loading and maintenance; furthermore, the operator does not have to interrupt the normal job stream to run them.

PROGRAMMING SYSTEMS - Program is written in BPS-BAL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30, 2540, 1403, Programmed Mode Switch, 1052 and basic compatibility.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-05.2.005 *M
CONTROL PROGRAM-67 - CAMBRIDGE MONITOR SYSTEM (CP-67/CMS)

AUTHOR: J. B. Harmon, J. A. Seymour, M. S. Field, S. E. Madnick, H. M. Manavati, L. H. Seawright, R. U. Bayles, J. A. Kelch, R. A. Meyer, T. D. Rosato

DIRECT TECHNICAL INQUIRIES TO:
J. B. Harmon
IBM Corp.
Cambridge Scientific Center
545 Technology Sq.
Cambridge, Mass. 02139

*** N - - 03.2 03.6 05.1 11.4 - - - ***

DESCRIPTION - CP/67 is a time-sharing multi-programming executive program which runs on a System 360, Model 67, and provides, when run in conjunction with the Cambridge

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Monitor System (CMS), a general purpose time-sharing system. CMS provides the facilities to create, debug and execute programs from remote terminals; among the languages available are OS/360 Assembler (F), FORTRAN (G) and PL/1 (F). CP/67 is also capable of running any System/360 operating system (including OS/360), as long as the operating system does not violate basic timing and data dependence rules.

PROGRAMMING SYSTEMS - Written in F-level OS/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - 360/67H, 2 2311 Disk Drives, 1 2400 Tape Unit, 1 1403 Printer, 1 2540 Card-Read-Punch, a 1052-7 On-Line Console, and 1 2702 Telecommunications Control with 2741 or 1050 Terminals.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - OPT1 - Source files for CP-67/CMS Users Guide. OPT2 - Update files.

ORDERING INFORMATION: PROGRAM NUMBER 360D052005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE		CODE	USER VOLUME REQUIREMENT
BASIC	none	MT	9/1600	29	02
		MT	9/800	28	02
OPTIONAL	OPT1	DTR	9/1600	29	none
		MT	9/800	28	01
	OPT2	DTR	9/1600	29	none
		DTR	9/800	28	none

360D-05.2.006 *M
PRIORITY OUTPUT WRITERS EXECUTION PROCESSORS AND INPUT READERS (POWER II)

AUTHOR: L. A. Whitney

DIRECT TECHNICAL INQUIRIES TO:
L. A. Whitney
IBM Corporation
7 Penn Center Plaza
Philadelphia, Pa. 19103

*** N - - 00.1 03.4 - - - - - ***

DESCRIPTION - This DOS system is an automatic SYSIN/SYSLST/SYSPCH spooling processor which requires no IBM or user program changes. Using a variable number of 2311 or 2314 modules for intermediate storage, this program acts as a peripheral processor and priority scheduler for normal batch processing under DOS. It can, simultaneously, operate up to 26 peripheral devices, maintain unique input/print/punch or print/punch streams for one or two DOS batch partitions.

Remote Job Entry, operating under POWER II, offers the ability to submit jobs, via remote IBM 2780 Terminals, for normal batch processing under DOS. The program will support up to five IBM 2780s on as many leased or dial-up lines. RJE operates in the same foreground partition (1 or 2) as POWER II. Jobs submitted remotely may be assigned a specific priority and directed to either batch partition for DOS processing. Output may be directed to local devices, a remote 2780 Terminal, or put in hold status for disposition at a later time. Central Installation Console Commands provide the capabilities needed by the central operator to control and maintain the RJE system. Work station commands allow users at the remote work stations to communicate with the RJE system and request RJE facilities.

RJE macros are assembled as options under POWER II. Users and telecommunication lines may be added to or deleted from RJE without having to regenerate the POWER II system. Only appropriate components need be assembled during generation, therefore tailoring the system to user needs.

PROGRAMMING SYSTEMS - Standard DOS. Source language is Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Any hardware which will support DOS; practically, however, 32K or 48K would be minimum core. Storage requirements: varies based on SYSGEN options; minimum would be 12K.

BASIC PROGRAM PACKAGE
Option 1 - POWER II Version 2
DOCUMENTATION - Application Directory, Recipients Letter, POWER II Program Description and Operations Manual (GH20-0737).

Option 2 - POWER II Version 2 with Remote Job Entry
DOCUMENTATION - Application Directory, Recipients Letter, POWER II Program Description and Operations Manual (GH20-0737), POWER II Remote Job Entry Program Description and Operations Manual (GH20-0761).

MACHINE READABLE - Options 1 and 2-- POWER II and Remote Job Entry Source Code.

OPTIONAL PROGRAM PACKAGE - None

ORDERING INFORMATION: PROGRAM NUMBER 360D052006

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	OPT1	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
	OPT2	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.2.007
HYPERVISOR FOR RUNNING 7074 EMULATOR AS AN OPERATING SYSTEM 360 TASK

AUTHOR: P. H. Collins
Joan Hoffman

DIRECT TECHNICAL INQUIRIES TO:
P.H. Collins
IBM Corporation
2125 Biscayne Blvd.
Miami, Fla. 33137

*** N - - - - - - - - - ***

DESCRIPTION - This OS Assembler language program allows the running of OS/360 and 7074 Emulator (360C-EU-725) concurrently in the same machine. The program is executed as a task of the operating system, thus the emulator operates under the priority of the task. Modifications have been made to the External interrupt to allow the key to be reserved for either OS or the Emulator. Low core save areas have been changed to prevent interference with the channel check handler.

PROGRAMMING SYSTEMS - The program is not level dependent on the operating system but is version and level sensitive to the emulatcr. This distribution supports the V3L1 version and lists the changes necessary for V4L0.

MINIMUM SYSTEM REQUIREMENTS - The system requires the "Shared Storage" RPQ and sufficient I/O and channels to support both the operating system and the emulator. The program requires less than 2K bytes of storage above the 262144 bytes required by the emulators. minimum requirements to run the system: 50 or 65 Model H with the Emulator feature and the Shared Storage RPQ; two consoles; sufficient channels and I/O devices to support both systems. The load module size is presently 1374 bytes, well below the minimum of 2096 byte block.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-05.2.008
DOUBLE 7074 EMULATION ON 360-65-I

AUTHOR: A. T. Foley

DIRECT TECHNICAL INQUIRIES TO:
A. T. Foley
IBM Corporation
555 Madison Avenue
New York, New York 10022

*** N - - 00.1 03.3 05.1 11.1 - - - ***

DESCRIPTION - This is a 360 ALP program which allows the S/360-65K with Shared Storage RPQ and 7074 Emulation feature to con-currently operate two 7074 programs in Emulation mode. This program is not model dependent i.e. 360-65. If such an RPQ were available on a Model 50, the program would also be able to run.

The two jobs running are logically independent and unaware of each others existence. They operate in a time-slicing mode based upon I/O interrupts. Each program has dedicated channels corresponding to the 7074 programs. Two consoles are supported. The primary resource shared is CPU time. 360-65I users who have 7074 emulation and 360-65K users who need to increase core for growth should review applicability of this program and the EMOS (7074/OS) program. They give emulator users the ability to multiprogram 7074 runs either with other 7074 runs or with OS without reprogramming gaining the advantage of overlapping setup, typing, rewinding and CPU as available with other productive computing.

PROGRAMMING SYSTEMS - Programming language - 360 ALP, and

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requires IBM Program 360C-EU-725 Version 3.

MINIMUM SYSTEM REQUIREMENTS - Program requires one tape for loading or program which is subsequently available to the system. The user will probably double his 7074 I/O configuration having for example, two typewriters, two card readers, 4 channels with 4 or 5 tape drives on each channel. No disk is used. The exact configuration will vary with the hardware requirements of the 7074 programs to be run.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-05.2.010 *M
INTERACTIVE APPLICATIONS SUPERVISOR (IAS/360)

AUTHOR: J. R. Wood Rita C. Summers
Joan P. Citron D. C. Loomis

DIRECT TECHNICAL INQUIRIES TO:
Rita C. Summers
IBM Los Angeles Scientific Center
1930 Century Park West
Los Angeles, California 90067

*** N - - 03.0 05.1 06.0 - - - - ***

DESCRIPTION - IAS/360 allows time-shared use of interactive application programs through 2741 and 2260 Terminals, under OS/360. IAS features dynamic creation and destruction of data sets, indexing, on-line updating, and exclusive control of data records; editing of terminal input timing of user responses, format control; string manipulation; multiple-user communication; controls for system operator and administrator; and on-line testing of new applications while production applications are being used. Under MFT other jobs can run concurrently with IAS. Application programmers use IAS macros and OS/360 Assembly Language. Examples of interactive applications are: Computer-assisted instruction, data base maintenance and inquiry, conversational programming, remote job entry, and message switching. Potential users include: colleges, libraries, government agencies, hospitals, and a wide variety of businesses interested in on-line use of files.

PROGRAMMING SYSTEMS - IAS is written in OS/360 Assembly Language; operates using OS/360.

MINIMUM SYSTEM REQUIREMENTS - System 360/40H; 2-2311 drives or 1-2314 for IAS, plus requirements for OS/360 and for applications; two terminals.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Option 1 - Source and object code for 2311 Disk users, and is specified by using Program Number Extension "2311". Option 2 - Source and object code for 2314 Disk users, and is specified by using Program Number Extension "2314".

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	2311	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	02
	2314	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-05.2.011
DOS/360 TIME ACCOUNTING SYSTEM

AUTHOR: W. R. Maple

DIRECT TECHNICAL INQUIRIES TO:
W. R. Maple
IBM Corporation
675 W. Market Street
Lima, Ohio 45802

*** N - - - - - - - - - ***

DESCRIPTION - The Time Accounting System is provided to

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permit users of DOS/360 to obtain more accurate data concerning the use of their computing system. An automated disk logging facility is basic to the system. Obtaining CPU time by partition and retaining user defined control card data is optional. Information is retained on disk for use as input to the user accounting processing. This information includes job and step names, partition identification, step termination reasons, job start time, step stop time, elapsed CPU time by partition, and user-defined data from //JOB or EXEC cards. Support is provided for non-multiprogramming supervisors as well as SPI, BJF, and asynchronous processing supervisors.

PROGRAMMING SYSTEMS - Written in the Assembler language but the sample reports are produced using two COBOL programs.

MINIMUM SYSTEM REQUIREMENTS - The CPU must have the Decimal Instruction Set, Interval Timer, and 16K of storage.

BASIC PROGRAM PACKAGE
DOCUMENATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-05.2.012 *N
44 MFT MULTIPROGRAMMING SYSTEM FOR THE 360 MODEL 44

AUTHOR: W. Franklin

DIRECT TECHNICAL INQUIRIES TO:
W. Franklin
High Energy Physics
Purdue University
Layfayette, Indiana 47907

*** S PDP - 03.0 03.4 05.0 05.1 - - - ***

DESCRIPTION - 44 MFT (Multiprogramming with a Fixed Number of Tasks) is a multiprogramming system for the 360 Model 44 which allows a background partition and up to thirteen foreground partitions. The background partition is compatible with a standard 44PS jobstream. The backgound jcb control processor has responsibility for initially invoking foreground partitions and for assigning System I/O units for their use. Foreground programs are usually I/O bound and have predictable usage patterns such as those for data acquisition, teleprocessing, and SPOOLing systems.

Various optional features are provided such as store and fetch protection, support for the instructions provided by the commercial feature, time-sharing the use of the background partition under control of any foreground partition, support for the channel-to-channel adapter, and an operator-communications partition. 44MFT will run on other 360 Models given the proper core and I/O configurations.

PROGRAMMING SYSTEMS - 44MFT is written in Assembler language and consists of replacement modules for 44PS. Updates for various 44PS modules where relevant are also provided. An existing 44PS system is required to construct the initial 44MFT system.

MINIMUM SYSTEM REQUIREMENTS - Same as that for 44PS with the consideration that the minimum supervisor is 22K and the minimum background is 36K. The system supports the SDSD, 2311, and 2314 for both user data sets and system residence.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-05.2.013 *N
DOS/RESQUEUE - RESOURCE QUEUING AND USER SVC'S

AUTHORS: J.J. Lincavage
R.D. Burke

DIRECT TECHNICAL INQUIRIES TO:
J.J. Lincavage

CONTINUED FROM PRIOR COLUMN

Volkswagen Atlantic Inc.
1001 South Trooper Road
Valley Forge, Pennsylvania 19481

*** N - - 03.7 - - - - - - - ***

DESCRIPTION - The main facility of DOS/360 Resqueue is a combination of additional supervisor services and Assembler Language macros which provide-controlled resource availability and protection among from 2 to twelve competing tasks. The facility operates across partitions in a non-multitasking environment. It operates within and/or across partitions in a multitasking environment. A task may sustain multiple enqueues concurrently. The enqueuing imperative statement has the following options-resource or element level, exclusive or shared, in use wait or in use return-i.e. conditional-, capacity exceed cancel or capacity exceed return, lock-up wait or lock-up return.

A secondary facility provides a direct linkage into the supervisor for user written supervisor call routines. The minimums for user supervisor calls linkage match those of DOS itself.

PROGRAMMING SYSTEMS - A system capable of running DOS multiprogramming is required. Additionally the decimal feature must be specified. The facility has run successfully on Release 19 through 21 without change, but may be release sensitive in the future.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D052013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.3.001
DISASSEMBLER FOR SYSTEM/360

AUTHOR: I. M. Miller

DIRECT TECHNICAL INQUIRIES TO:
I. M. Miller
IBM Corp.
P. O. Box 390
Poughkeepsie, N. Y.

*** N - - 06.8 04.4 - - - - - ***

DESCRIPTION - The Disassembler will translate object decks generated by BPS FORTRAN, FORTRAN E, FORTRAN H, COBOL E and the Basic Assembler to Assembly Language code. It is a stand alone system which can be loaded from the card reader or from a tape drive. It can produce listings and/or a punched deck of the disassembled code with or without user specified symbols.

PROGRAMMING SYSTEMS - Stand alone. The program can be used to produce listings for programs in which their listings were not available, inadequate, or lost, to punch a deck for purposes of hand optimizing, and tc provide instruction counts for purposes of systems evaluation. Provides an interface for corrections to OS/360.

MINIMUM SYSTEM REQUIREMENTS - 64K S/360 Model 30 with a card reader (00C) and printer (00E). For tape and punched output features, it needs a tape drive (180) and punch (00D).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D053001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-05.5.001
44 PS LOADER

AUTHOR: W. Franklin

CONTINUED FROM PRIOR PAGE

DIRECT TECHNICAL INQUIRIES TO:
W. Franklin
High Energy Physics
Purdue University
Lafayette, Indiana 47907

*** S PDP - 07.5 - - - - - - ***

DESCRIPTION - This 44PS Loader is a system routine designed to provide many features of the standard 44PS Linkage Editor while providing considerable performance improvements for the Model 44 FORTRAN batch processing environment. The loader can be loaded from the phase library (SDSABS) by using an EXEC card. Various execution time options are provided, including the ability to specify private relocatable libraries on both tape and disk. This permits separate libraries for each application requiring special application-oriented modules.

PROGRAMMING SYSTEMS - The program is written in Assembly Language and has been tested with 44PS Versions 3 and 4; however, the program should be release independent.

MINIMUM SYSTEM REQUIREMENTS - The required machine configuration is identical to that for 44PS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D055001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.0.005
BILINGUAL CHEQUE AMOUNT SETUP

AUTHOR: Q. J. Maltby

DIRECT TECHNICAL INQUIRIES TO:
G. J. Maltby
North American Life Assce. Co.
105 Adelaide Street
West Toronto 1, Ontario

*** N - CKT - - - - - - - ***

DESCRIPTION - This module (control section of 1,712 bytes named "CHEKTRAN") will provide both numeric and alphabetic amount descriptions for direct transfer to output lines in cheque writing operations.

The following language/currency combinations are handled.
- English language; dollars and cents.
- French language; dollars and cents.
- English language; pounds, shillings, and pence.
- English language; pounds and newpence.

There is considerable flexibility in the alphabetic output formatting which allows rational multi-line setup where required on long strings of words. Values of one billion dollars or more are not handled. The routine accepts output filed description parameters as well as the amount to be converted. These parameters allow control of language/currency, total alphabetic output length allowed, line length, and indentation.

PROGRAMMING SYSTEMS - Programming language - Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 or better with Decimal feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D060005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.1.003
SORT 2 OR SORT 7 TO BPS SORT CONTROL CARD CONVERSION UTILITY PROGRAM

AUTHOR: C. B. Conn

DIRECT TECHNICAL INQUIRIES TO:
C. B. Conn

CONTINUED FROM PRIOR COLUMN

IBM Corp.
330 Madison Ave.
New York, N. Y. 10017

*** N - - - - - - - - - ***

DESCRIPTION - This program converts 1401 SORT 2 or SORT 7 control cards to control cards used by the BPS Sort/Merge program. Conversational mode via the 1052 Console Typewriter is used to develop parameters not available in the 1401 sort control cards. Control cards for processing fixed- or variable-length records, blocked or unblocked, can be created. From three to six tapes may be specified by the user, and from one to five control fields will be accepted. Ascending or descending file sequence is supported.

PROGRAMMING SYSTEMS - Written in BPS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Tape system above the Model 20.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D061003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.1.004 *M
TSORT/001TSORT

AUTHOR: H. W. Ketchum, Jr.

DIRECT TECHNICAL INQUIRIES TO:
Gary R. Sternberg
Macke Co.
1 Macke Circle
Cheverly, Md. 20781

*** N - - - - - - - - - ***

DESCRIPTION - This program is intended for the user of seven track tape drives who wishes to sort both BCD (1400-created) and EBCDIC (360-created) tape files which are too large to sort on his available disk capacity. Since the program does not use the Read Backward feature, the user may sort with either Data Convert or Translate on. TSORT will sort files with either 1400 or 360 standard labels. When sorting 1400 files, the last input header and trailer labels are copied onto the final output tape. When sorting 360 files the user may request standard label generation; otherwise the file is assumed to include only an 80-byte volume label, header label and trailer label which are copied at 800 bpi, even parity, Translate on.

PROGRAMMING SYSTEMS - Written in S/360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - The program runs in the background partition under DOS/360 and requires 7K core storage, plus the tape logic modules IJFFZZWZ and IJFFZCWZ, plus six times either the input or output blocking factor, whichever is larger.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D061004

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-06.1.005 *N
MARC II SORT PROGRAM

AUTHOR: P. R. Reimers

DIRECT TECHNICAL INQUIRIES TO:
Coordinator of Information Systems
The Library of Congress
10 First Street, S.E.
Washington, D.C. 20540

*** N - - 06.0 06.2 - - - - - ***

DESCRIPTION - The MARC Sort Program prepares files in MARC II Processing Format for input to the IBM S/360 Tape Sort/Merge Program. Input to the MARC Sort Program is the MARC II, Library of Congress Processing Format. The program is made up of Sort-key edit Routine (SKED) and user's own coding for EXIT 22 of TSRT. SKED translates data to assist in producing a library arrangement when sorted by TSRT using the collating sequence for TSRT. SKED builds sort keys according to parameters specified at run-time and has the capability to duplicate records when more than one combination of tags in the directory satisfies a particular set of parameters.

CONTINUED FROM PRIOR PAGE

The coding that is added to EXIT 22 of TSRT removes the sort-key. The peripheral assignments for sorting depend upon environmental and sorting requirements. Generally, five tape drives have been used at the Library of Congress.

PROGRAMMING SYSTEMS - The program is written in Assembler Language using Assembler F, 360N-AS-466, change level 3-2. The program has been tested using DOS Release 18 (the program is expected to run under subsequent releases), with accompanying TSRT (Tape Sort/Merge 360N-SM-400, change level 3-1). Programs environment - Batch processing (will operate in a multiprogramming environment with no change)... Module linkage - Standard DOS Macros...Program residence - DOS Core Image Library... IOCS support level - Logical and Physical IOCS.

MINIMUM SYSTEM REQUIREMENTS - 2030 CPU (32K)... 2540 Card Reader/Punch... 1403 N1 Printer... 1052 Console Typewriter... Five 2400 Series Magnetic Tape Units (9-track)... Necessary devices to support a DOS/TOS System. (SKED requires an on-line printer, a card reader and three tape units).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D061005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-06.3.001
1012 PAPER TAPE READ/PUNCH PROGRAM

AUTHOR: R. P. Herder

DIRECT TECHNICAL INQUIRIES TO:
R. P. Herder
IBM Corp.
Detroit Automotive Dept. 129
7700 2nd Blvd.
Detroit, Mich. 48202

*** N - - 07.4 08.4 23.4 - - - - ***

DESCRIPTION - This program provides software support for a 1012 Paper Tape Punch attached to a S/360. Both reading and punching is accomplished by this program on a sub-program which adheres to the standard linkage to call this program. Any number of translate tables for 5, 6, 7, and 8 track may be used. The standard register usage for program linkages is followed thereby allowing a program written in any language which adheres to these linkage conventions to call this sub-program. Error routines are incorporated on an execute channel program level to facilitate error recovery when reading or punching with the 1012 Paper Tape Punch.

PROGRAMMING SYSTEMS - S/360 Basic Assembler Language program written to operate under control of the Disk Operating System, (Version II).

MINIMUM SYSTEM REQUIREMENTS - S/360 16K storage, Decimal Arithmetic, 2540 Card Reader, and a 1012 Paper Tape Punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.3.003
BASIC AUTODIN ACCESS METHOD FOR S/360 DOS

AUTHOR: R.S. Cahall

DIRECT TECHNICAL INQUIRIES TO:
R.S. Cahall
IBM Corporation
11141 Georgia Ave.
Wheaton, Maryland 20902

*** N - - - - - - - - - ***

DESCRIPTION - This program module provides a macro language and access method which will allow a user to write application programs interfacing the AUTODIN Network with an IBM 2701 with appropriate adapter RPQ's. The user

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program must satisfy the U. S. Government rules and regulations imposed by JANAP 128 and H500. This program is to be used with S/360 DOS.

PROGRAMMING SYSTEMS - The program is written in Basic Assembler Language; runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.3.004
S/360 AUTODIN MULTIMEDIA TERMINAL PROGRAM

AUTHOR: R. S. Cahall

DIRECT TECHNICAL INQUIRIES TO:
R. S. Cahall
IBM Corp.
11141 Georgia Ave.
Wheaton, Md. 20902

*** N - - - - - - - - - ***

DESCRIPTION - This program is a complete programming package designed to provide the S/360 user with an Autodin terminal capability. The design criteria used was very similar to the Model 20 AMT program. The program is designed on a modular basis - card, magnetic tape, paper tape and printers.

PROGRAMMING SYSTEMS - Written in DOS/360 Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - A 32K Model 30 with disk support for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.3.006
GENERALIZED TELEPROCESSING PROGRAM FOR SYSTEM/360

AUTHOR: W. B. Bates, Jr.

DIRECT TECHNICAL INQUIRIES TO:
W. B. Bates, Jr.
IBM Corporation
205 Whitney Avenue
New Haven, Conn. 06510

*** N - - 00.6 05.1 30.1 50.1 - - - ***

DESCRIPTION - The Generalized Teleprocessing Program for System/360 is designed to serve as the basis of a users teleprocessing application. The program, operating in 36K, is completely modular and is designed to be easily modified by the use of user dependent constants. This program will handle at present a maximum of thirty-two of the user's DASD files. The user writes his own Inquiry phases based upon a skeletal program. The number of these Inquiry phases is limited by the amount of room that the user has in his Core Image Library. The Inquiry phases are loaded from the transient area of the Core Image Library as they are needed to process input messages. The program presently handles one line group but can be modified by the user dependent constants to handle a maximum of sixteen line groups. The number of terminals that the program now handles is five but this also can be changed to a maximum of thirty-two per line groups. All messages are queued in core and teleprocessing line activity is overlapped with user message processing. This package can be an excellent demonstration of the 2260 Display Station using tailored inquiries into the customer's own teleprocessing system.

PROGRAMMING SYSTEMS - Written in DOS Assembler Language

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using BTAM.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.3.007
DOS BTAM FOR LEASED LINE KSR 35 TELETYPES

AUTHOR: K. Treiber

DIRECT TECHNICAL INQUIRIES TO:
K. Treiber
IBM Corporation
340 Market Street
San Francisco, Calif. 94111

*** N - - 03.4 03.7 - - - - - ***

DESCRIPTION - The program consists of modified DOS BTAM Release 15 (Version II) macros to support these terminals on a nonswitched line. It has been tested on DOS Release 16 (Version III) and no problems were encountered. The major purpose of the modification was to enable the problem programmer to code BTAM "READ" and "WRITE" macros that would result in the generation of specific channel programs for communications with the teletype. Modifications such as this and any future modifications require knowledge of System/360 and DOS physical IOCS, the Telecommunications Control Unit (270X) and Telegraph II Adapter, the KSR 35 Teletype, and DOS Assembler and Macro Language. The problem programmer, however, does not necessarily need to know more than DOS ETAM, and telecommunications programming logic.

PROGRAMMING SYSTEMS - All coding is DOS Assembler E; operates using 360/DOS.

MINIMUM SYSTEM REQUIREMENTS - The core requirements for I/O modules are 3K + 120 bytes/terminal. The terminals should be connected through a data set and 270X Control Unit (with Telegraph Type II Adapter) to any 360/30 or larger.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.3.008
AUTODIN ACCESS METHOD FOR CS/360

AUTHOR: E. A. Thompson

DIRECT TECHNICAL INQUIRIES TO:
AUTHOR: E. A. Thompson

DIRECT TECHNICAL INQUIRIES TO:
E. A. Thompson
IBM Corporation
11141 Georgia Avenue
Wheaton, Maryland 20902

*** N - - - - - - - - - ***

DESCRIPTION - The Access Method described here provides routines which will allow a user to inteface with the AUTODIN Network through an IBM 2701 with appropriate adapter RPQ's. Also included are Assembler language macros to allow the user linkage to the access method, a simulator to permit testing prior to installation of the 2701, and a trace routine to aid in debugging. Although the user program must satisfy the U. S. Government rules and regulations imposed by JANAP 128 and DCA CIRCULAR 370-D175-1, all well defined line control operations are handled by the access method.

PROGRAMMING SYSTEMS - Written in System/360 ALC and uses certain standard system macros.

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MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACAKGE
DOCUMENATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACAKGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.3.012 *N
A HIGH SPEED BISYNCHRONOUS COMMUNICANTIONS ACCESS METHOD

AUTHOR: G.M. Stabler

DIRECT TECHNICAL INQUIRIES TO:
G.M. Stabler
Center for Computer & Information Sciences
Brown University
Providence, R.I. 02912

*** S BUC - 03.4 - - - - - - - ***

DESCRIPTION - The Bisynchronous Communications Access Method is a set of 360 programs which support queued telecommunications over a high speed (40.8K BAUD) point-to-point half duplex line connecting a 360 and an 1130 or another 360.

The system, which employs EXCP for all I/O and handles all message blocking, line protocol, and error checking internally, is called at the GET/PUT level from Assembly Language programs. The system will support any number of logical users (message destinations) in either machine, and can support any number of remote terminals. Since all user messages are transmitted in "transparent text" mode, there are no restrictions on the type of data a user may send. Line protocol conforms to conversational Bisynchronous Communications standards.

PROGRAMMING SYSTEMS - Support analogous to this package is provided for an 1130 system by the Type 4 program entitled "An 1130 High Speed Bisynchronous Communications System". Written in Assembler language; operates under OS/360 MVT.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360 MVT.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.3.014 *N
PHARMACY PROCESSING IN A HOSPITAL INFORMATION SYSTEM WITH MISP

AUTHOR: S.P. Oberheim

DIRECT TECHNICAL INQUIRIES TO:
Director of Data Processing
Monmouth Medical Center
3rd and Pavilion Avenues
Long Branch, New Jersey 07740

*** N - - - - - - - - - ***

DESCRIPTION - The Pharmacy Processing program consists of six phases that provide: 1) A schedule of pending pharmacy requisitions (DEP00044, FGP00143). 2) A facility to designate the status of a particular requisition and post the billing (FGG0045, FP00046). 3) A reminder of the unfilled requisitions (DEP00105, FGP00106). The package provides the pharmacy with a real time information system with both an inquiry and an update capability.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language with macro support from the Medical Information System (MISP), an IBM Type II release. Operates using DOS/360 with control and interface facilities provided by MISP.

MINIMUM SYSTEM REQUIREMENTS - Utilizes a S/360 Model 40 with 128K storage. Requires at least 10K for assembling.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.3.015 *N
NURSING INSTRUCTION ORDER PROCESSING IN A MEDICAL INFORMATION SYSTEMS ENVIRONMENT

AUTHORS: Mrs. Michele Hilner Mrs. Rita Levin

DIRECT TECHNICAL INQUIRIES TO:
Director of Data Processing
Monmouth Medical Center
Third and Pavillon
Long Branch, New Jersey

*** N - - - - - - - - - - ***

DESCRIPTION - The Nursing Instruction Order Processing System is designed to handle specific kinds of doctor's orders in a Medical Information Systems environment. It requires the Medical Information Systems Programs (MISP), an IBM Type II release and macro support that is furnished in this package. This system includes 5 programs: 1. Order translate; 2. Order verify; 3. Order reprint ; 4. Order translate error phase; 5. Order cancel.

PROGRAMMING SYSTEMS - Written in Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - The same as those required for MISP, and operates under DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D063015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.4.001
SYSTEM/360 BINARY SEARCH

AUTHOR: R. W. Sandstedt

DIRECT TECHNICAL INQUIRIES TO:
R. W. Sandstedt
IBM Corp.
220 Church St.
New York, N. Y. 10013

*** N - - 07.1 04.6 - - - - - ***

DESCRIPTION - This S/360 reentrant module performs a binary search of one or more tables in main storage. It also constructs new tables from entries supplied in random sequence and adds entries to or deletes entries from existing tables. Each table may contain 9999 entries maximum in ascending sequence. Each table entry must be a fixed length of 9999 bytes maximum. A fixed length table argument may consist of alphameric, packed decimal, or fixed point half or full word binary data and must be located within the first 256 bytes of entry. The module is optimized for minimum execution time. The module may be accessed in COBOL via the CALL statement or in Assembler language via the CALL or LINK macro-instructions, and it returns binary information which can be interpreted conveniently by modules written in either language.

PROGRAMMING SYSTEMS - Source language is Assembler, which can be assembled and run under BOS or OS.

MINIMUM SYSTEM REQUIREMENTS - It requires a S/360 Model 30 with Standard Instruction Set (packed decimal searches require the decimal instruction set) and occupies 696 bytes of main storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D06[illegible]001

CONTINUED FROM PRIOR COLUMN

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.4.002
1092/93 KEYMAT DECODING WITH MEDICAL INFORMATION SYSTEM PROGRAMS

AUTHOR: M. E. Withers

DIRECT TECHNICAL INQUIRIES TO:
M. E. Withers
IBM Corp.
Dept. 867
Exit 136, Garden State Parkway
Cranford, N. J. 07016

*** N - - 01.1 03.7 - - - - - ***

DESCRIPTION - This program provides a means for decoding a keymat for a 1092/93 programmed keyboard for a MISP (Medical Information System Programs) installation. The 1092/93 Keymat Decoding Table Load Utility, DEPZMUDC, loads a formatted 2311 data set from cards containing information associated with a specific button for a given keymat. The macro, MISLDCAN, enables a user to obtain this interpretative information using column and button numbers as search parameters.

PROGRAMMING SYSTEMS - Both the utility and the macro are written in System/360 DOS Assembler Language. The programs may also be used with TESTMISP (360D-04.4.007).

MINIMUM SYSTEM REQUIREMENTS - Those required by DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D064002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.5.002
CNV 650 SUBROUTINE

AUTHOR: F. Stephens Gauss

DIRECT TECHNICAL INQUIRIES TO:
F. Stephens Gauss
United States Naval Observatory
Washington, D. C.

*** N USNO - 06.6 12.1 03.8 - - - - ***

DESCRIPTION - CNV650 is written as a FORTRAN IV subroutine subprogram for the IBM System/360 to convert BCD signed numbers (overpunched) into a numeric character and a sign character. The type of zone overpunch is also returned. Special characters used as input will produce an error message and a numeric value of plus o. On the 360/40 1052 bytes of storage are used.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - The basic requirements are a 32 bit word length and System/360 internal coding.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D065002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.5.003
DECIMAL SHIFT MACRO

AUTHOR: Mr. R. A. Belz

DIRECT TECHNICAL INQUIRIES TO:
Mr. R. A. Belz
IBM Corp.
SDD Dept. D50
Bldg. 706 Box 390
Poughkeepsie, N. Y. 12602

CONTINUED FROM PRIOR PAGE

*** N - - 03.7 40.3 - - - - - ***

DESCRIPTION - This program is a macro for use at assembly time on the IBM System/360. It generates the required code for decimal shifts in core storage locations.

PROGRAMMING SYSTEMS - It is coded in Assembler (E) Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 with Decimal Instruction Set.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D065003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.5.006 *M
UNIVAC-1108 TO IBM-360 FLOATING POINT INTERNAL CONVERTER ('CVFL08')

AUTHOR: Un Young Rhee

DIRECT TECHNICAL INQUIRIES TO:
Un Young Rhee
Southwest Ctr. For Advanced Studies
P.O. Box 30365
Dallas, Texas 75230

*** S GRS - 07.2 08.5 12.1 40.4 - - - ***

DESCRIPTION - The S/360 Assembler CVFL08 program is designed to convert UNIVAC 1108 floating point single precision number(s) to 360 floating point single or double precision number(s). This subroutine can be called by either FORTRAN or PL/I programs. However, in a PL/I program, particular attention should be paid to attributes of passing parameters. (More detailed information such as calling sequence, accuracy of significant bits, etc., can be found in comment section of the program listing).

PROGRAMMING SYSTEMS - Written in Assembler (F), and has been compiled and tested using OS on a S/360 Model 50.

MINIMUM SYSTEM REQUIREMENTS - The CVFL08 program should run on any S/360 Model 30 and up.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D065006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.5.007
7090 TO 360 FLOATING POINT INTERNAL CONVERTER ('CVFL90')

AUTHOR: Un Young Rhee

DIRECT TECHNICAL INQUIRIES TO:
Un Young Rhee
Southwest Ctr. for Advanced Studies
P.O. Box 30365
Dallas, Texas 75230

*** S GRS - 07.2 08.5 12.1 40.4 - - - ***

DESCRIPTION - The S/360 Assembler CVFL90 program is designed to convert 7090 floating point single precision number(s) to 360 floating point single or double precision number(s). This subroutine can be called by either FORTRAN or PL/I programs. However, in a PL/I program, particular attention should be paid to attributes of passing parameters. (More detailed information such as calling sequence, accuracy of significant bits, etc., can be found in comment section of the program listing.)

PROGRAMMING SYSTEMS - Written in Assembler (F), and has been compiled and tested using OS on a S/360 Model 50.

MINIMUM SYSTEM REQUIREMENTS - CVFL90 should run on any S/360 Model 30 and up.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

CONTINUED FROM PRIOR COLUMN

ORDERING INFORMATION: PROGRAM NUMBER 360D065007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.6.001
FORTRAN PERMUTATION GENERATION SUBROUTINE

AUTHOR: Mr. D. C. Mollen

DIRECT TECHNICAL INQUIRIES TO:
Mr. D. C. Mollen
IBM Corp.
Garden State Parkway
Exit 136
Cranford, N. J. 07016

*** N - - 13.5 15.1 15.6 - - - ***

DESCRIPTION - Given a positive integer, N, greater than or equal to 3 and a matrix of size N factorial rows by N columns, this subroutine generates all the possible permutations of the first N positive integers in the given matrix. Each row of the matrix contains one of the permutations, with each of the integers occupying a separate position within the row. The subroutine is written in BPS FORTRAN and will generate any size matrix desired, given sufficient core storage.

PROGRAMMING SYSTEMS - Written in BPS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Any System/360 with FORTRAN capability.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D066001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.6.002
BYTE/BIT MAP - A MACRO FOR PROGRAMS RECEIVING DATA FROM 1092 KEYBOARD TERMINALS

AUTHORS: R. W. Kukla W. E. Brandt

DIRECT TECHNICAL INQUIRIES TO:
R. W. Kukla
IBM Corporation
1120 Connecticut Ave. N.W.
Washington, D.C. 20036

*** N - - - - - - - - - ***

DESCRIPTION - A macro to produce a bytemap and bitmap from the input received from a 1092 (and 1093, if present) terminal. For use in programs running under MISP or TESTMISP (File Number 360D-04.4.007).

A bytemap represents each column of the 1092 (except MKD columns) by a byte with X'40' if no key is depressed, or by binary values 0 through 9 if one is depressed. MKD columns are represented by one byte per button with X'40' or binary 1.

A bitmap has one bit for each column or MKD button, 0 if corresponding bytemap byte is X'40', or 1 otherwise.

PROGRAMMING SYSTEMS - The macro is Assembly Language DOS/TOS for System/360 with terminals, specifically 1092/1093, controlled by 2702.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D066002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.6.003 *M
FORTRAN CHARACTER STRING PACKAGE

AUTHOR: H. P. Sieglaff

DIRECT TECHNICAL INQUIRIES TO:
H. P. Sieglaff
3610 W. Northview
Phoenix, Arizona 85021

*** S MNC FCSP 06.3 06.4 - - - - - ***

DESCRIPTION - The package enables the FORTRAN programmer to process character strings. The FORTRAN programmer can compare, filter, insert, move, scan, and binary search character strings by calling one or more of the six subroutines.

PROGRAMMING SYSTEMS - The package consists of subroutines written in OS Assembly Language F and was tested using OS FORTRAN Language 4 G Level and OS Version 13.

MINIMUM SYSTEM REQUIREMENTS - The package should work on any S/360 machine which has FORTRAN V G and OS. (Maximum core requirements is 1K).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D066003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.6.004 *M
CHARACTER FILTER PL/I

AUTHOR: H. P. Sieglaff

DIRECT TECHNICAL INQUIRIES TO:
H. P. Sieglaff
3610 W. Northview
Phoenix, Arizona 85021

*** S MNC PSAS - - - - - - - ***

DESCRIPTION - The subroutine provides a means to skip or seek specified characters while scanning a string of characters for a PL/I program. The routine can be used to filter in/out alphabetic, numeric, alphanumeric, or other characters while scanning a character string.

PROGRAMMING SYSTEMS - The subroutine is written in OS Assembly Language F and was tested using OS PL/I Language F Level and OS Version 13 on a S/360 Model 50.

MINIMUM SYSTEM REQUIREMENTS - The package should work on any S/360 machine with FORTRAN IV G and OS. (Maximum core requirements is 1K).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D066004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.002
SELMAINF - CREATES AND MAINTAINS A SOURCE LIBRARY OF S/360 PROGRAMS UNDER DOS.

AUTHOR: Mr. R. E. Stoakes

DIRECT TECHNICAL INQUIRIES TO:
Mr. R. E. Stoakes
IBM Corp.
650 N. Main St.
Rockford, Ill.

*** N - - - - - - - - - ***

DESCRIPTION - This is a source program librarian program to create and maintain a library of System/360 source programs on disk or tape. It can process source decks coded in RPG, FORTRAN or COBOL. Specifically it will -

- Create an initial library.
- Add, delete and replace entire programs.
- Select programs for card or tape output.
- Edit programs by sequence number.
- Resequence programs.

CONTINUED FROM PRIOR COLUMN

- List programs.
- List all library program names.
- Select programs for immediate compilation.

This program enables a user to maintain bulky source program decks on disk or tape. A simple method is offered for altering source programs. The job control stream can be easily arranged for batch compilation of updated source programs.

PROGRAMMING SYSTEMS - Written in COBOL for use primarily with DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 24K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.003
S/360 BOS PROGRAM LIBRARY CATALOGING TAPE UTILITY PROGRAM

AUTHOR: P. D. Bowman

DIRECT TECHNICAL INQUIRIES TO:
P. D. Bowman
IBM Corporation
100 S. Wacker Drive
Chicago, Illinois 60606

*** N - - 00.3 - - - - - - ***

DESCRIPTION- This program maintains an installation program library on tape. The objects decks on the tape are separated by control cards supplied by the maintenance program which allow cataloging directly to the core image library from the tape. During maintenance runs on the tape, a report is generated giving program name, location on the tape (starting record number for punching) and status (new, replacement this run, or merely copied this run). The cataloging function provides a fast, clean approach to adding user programs to a SYSRES core image library when installing new releases of the operating system, returning from backup, or building additional system residence packs. Thus, the program allows object deck cataloging, maintenance and storage procedures which provide compactness, speed and documentation while reducing card handling. By using dummy phase cards, this program may also be used to maintain a tape of source decks or 1400 programs.

PROGRAMMING SYSTEMS- The source language is BAL, and it requires S/360 BOS to run.

MINIMUM SYSTEM REQUIREMENTS- System/360 Model 30 or above, 16K storage, Decimal Arithmetic, a 2311 Disk Drive, two 2400 Tape Drives, a 1052 Console Typewriter, a card reader and a card punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.005
A CLUSTER ANALYSIS AND TAXONOMY SYSTEM FOR GROUPING AND CLASSIFYING DATA

AUTHORS: J. Rubin H. P. Friedman

DIRECT TECHNICAL INQUIRIES TO:
J. Rubin
IBM Corporation
N. Y. Scientific Center
590 Madison Avenue
New York, New York 10022

*** N - - - - - - - - - ***

DESCRIPTION- Attempts to find the optimal way of organizing a set of objects into groups, according to one of several criteria. Each object is represented by a set of observations. Each criterion is a function of a partition of the set, and is intended to be a measure of the structure

CONTINUED FROM PRIOR PAGE

of that partition. Two measures are based on similarity coefficients computed between each pair of objects, and depend on a parameter running from 0 to 1. A tree structure can be created by running at several levels of this parameter. Other measures use variance-covariance criteria. The program searches for the optimal partition via a hill-climbing routine, which sifts through the partitions of the set, and which is designed to be effective not only for the encoded criteria, but for any criterion which can be formulated as a function of the partitions of a set. For similarity based measures, the program will accept mixed discrete, rank-ordered and continuous data (decimal or integer) in a general input format and scales all input.

PROGRAMMING SYSTEMS - Written in G Level FORTRAN and 360 Assembler Language and designed to run on the S/360 under OS.

MINIMUM SYSTEM REQUIREMENTS - 128K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.7.006
A CLUSTER ANALYSIS AND TAXONOMY SYSTEM FOR GROUPING AND CLASSIFYING DATA

AUTHORS: Mr. J. Rubin Mr. H. P. Friedman

DIRECT TECHNICAL INQUIRIES TO:
Mr. J. Rubin
IBM Corporation
N. Y. Scientific Center
590 Madison Avenue
New York, New York 10022

*** N - - - - - - - - - ***

DESCRIPTION- Attempts to find the optimal way of organizing a set of objects into groups, according to one of several criteria. Each object is represented by a set of observations. Each criterion is a function of a partition of the set, and is intended to be a measure of the structure of that partition. Two measures are based on similarity coefficients computed between each pair of objects, and depend on a parameter running from 0 to 1. A tree structure can be created by running at several levels of this parameter. Other meausres use variance-covariance criteria. The program searches for the optimal partition via a hill-climbing routine, which sifts through the partitions of the set, and which is designed to be effective not only for the encoded criteria, but for any criterion which can be formulated as a function of the partitions of a set. For similarity based measures, the program will accept mixed discrete, rank-ordered and continuous data (decimal or integer) in a general input format and scales all input.

PROGRAMMING SYSTEMS- Written in G Level FORTRAN and S/360 Assembler Language and designed to run on the S/360 under OS.

MINIMUM SYSTEM REQUIREMENTS- 256K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.7.007
A CLUSTER ANALYSIS AND TAXONOMY SYSTEM FOR GROUPING AND CLASSIFYING DATA

AUTHORS: Mr. J. Rubin Mr. H. P. Friedman

DIRECT TECHNICAL INQUIRIES TO:
Mr. J. Rubin
IBM Corporation
N. Y. Scientific Center
590 Madison Avenue
New York, New York 10022

CONTINUED FROM PRIOR COLUMN

*** N - - - - - - - - - ***

DESCRIPTION- Attempts to find the optimal way of organizing a set of objects into groups, according to one of several criteria. Each object is represented by a set of observations. Each criterion is a function of a partition of the set, and is intended to be a measure of the structure of that partition. Two measures are based on similarity coefficients computed between each pair of objects, and depend on a parameter running from 0 to 1. A tree structure can be created by running at several levels of this parameter. Other measures use variance-covariance criteria. The program searches for the optimal partition via a hill-climbing routine, which sifts through the partitions of the set, and which is designed to be effective not only for the encoded criteria, but for any criterion which can be formulated as a function of the partitions of a set. For similarity based measures, the program will accept mixed discrete, rank-ordered and continuous data (decimal or integer) in a general input format and scales all input.

PROGRAMMING SYSTEMS- Written in G Level FORTRAN and S/360 Assembler Language and designed to run on the S/360 under OS.

MINIMUM SYSTEM REQUIREMENTS- 512K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.7.008 *M
BANTAM - DOS/TOS SOURCE LIBRARY MAINTENANCE PROGRAM

AUTHOR: B. J. Burian

DIRECT TECHNICAL INQUIRIES TO:
B. J. Burian
IBM Corporation
555 Madison Avenue
New York, New York 10022

*** N - - 00.3 00.7 01.6 - - - - ***

DESCRIPTION- This utility will maintain source libraries on disk (DOS only) or tape with facilities to add, delete, number and name menters... add, delete, and change source statements... create input to compilers... and generate job control statements to create input files for a catalogue. Use of Bantam options in a testing environment enables the user to establish an effective testing procedure, eliminating inefficient source and object deck handling. Bantam interfaces with DOS/TOS library and compiler facilities to give the user maximum system utilization.

USE- This program in a testing environment will offer the user -

- An ordered file of his "in-test" and production programs.
- The elimination of unnecessary source and object deck manipulation.
- Documentation of all changes made to his programs.
- The ability to keep job control statements for compilation, linkage editing and execution of a program in a private library with the source statements.
- The facility to compile, linkage edit and execute or to compile and catalogue without card handling.

PROGRAMMING SYSTEMS - The program is written in Assembler Language to operate under DOS/TOS supervisors.

MINIMUM SYSTEM REQUIREMENTS- 32K bytes of main storage and five tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.7.009 *M

S/360 MANAGEMENT INFORMATION SYSTEM (MIS)

AUTHORS: P. Semple, Jr. A. Danzis
S. Temcheff M. Flynn
A. Seife R. Barrett

DIRECT TECHNICAL INQUIRIES TO:
P. Semple, Jr.
IBM Corporation
11141 Georgia Avenue
Wheaton, Maryland 20902

*** N - - - - - - - - - - ***

DESCRIPTION- The S/360 Management Information System (MIS) provides a terminal oriented capability to retrieve pre-defined reports, or subsets of them, from a single file using an easy-to-learn vocabulary. Key restrictions are-limited file maintenance capability; user normally reloads entire master file on a periodic basis; if sorting required, maximum is 300 records; 2260 support is local only.

PROGRAMMING SYSTEMS- Source Language- With the exception of two modules (MIS440, MIS460) which are coded in COBOL -F, S/360 MIS is written in Assembler F Language and utilizes OS/360

MINIMUM SYSTEM REQUIREMENTS- 256K, Model 40- This is not recommended, since only 20-30K remain for background programs. In addition to normal S/360 Operating System requirements, the user should have 1-2311 and a 2848 Control Unit Model III for 2260 local operations and/or a 2702 for 1050, 2740, and 2741 terminals Storage requirements- One 2311 is recommended.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.7.010

DISK1400 - S/360 1400 FILE ACCESS SUBROUTINE

AUTHOR: Mr. C. Alexander

DIRECT TECHNICAL INQUIRIES TO:
Mr. C. Alexander
IBM Corporation
22720 Michigan Avenue
Dearborn, Michigan 48124

*** N - - 12.1 - - - - - - ***

DESCRIPTION - "DISK1400" is an Assembler Language subroutine to assist 1400 System/360 users in their programming conversions to native System/360 mode. The subroutine provides the capability of reading and/or rewriting 1400 disk files with DOS COBOL, Assembler, PL/I, etc. "DISK1400" can be used in converting 1400 file organizations to S/360 file organizations, or as an interim means of accessing 1400 data in reprogrammed applications. The subroutine supports sector or track record files, with a maximum of twenty (20) sector records or one (1) track record accessed per call.

PROGRAMMING SYSTEMS- The subroutine is written in Assembler Language at the physical IOCS level. It operates under DOS version II-III (DOS File Protect option-no).

MINIMUM SYSTEM REQUIREMENTS- Those required for DOS. (The subroutine itself requires approximately 1200 bytes of core storage).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.011

FILING AND SOURCE DATE ENTRY TECHNIQUES FOR EASIER RETRIEVAL (FASTER) OS VERSION

AUTHOR: R. E. Gentry

CONTINUED FROM PRIOR COLUMN

DIRECT TECHNICAL INQUIRIES TO:
R. E. Gentry
IBM Corporation
Department 868
11141 Georgia Ave.
Wheaton, Maryland 20902

*** N - - 00.6 03.7 05.1 06.3 - - - ***

DESCRIPTION - FASTER (S/360 OS) (Also known as Gentry Monitor) is a programming system for retrieval and maintenance of "IS" files from terminals. The methods used are applicable to a wide variety of applications. FASTER incorporates a macro-language which provides for writing message processing programs on a functional level. Some of the major functions supported by the language include- Modification and addition to and retrieval from indexed sequential files, data manipulation (including Boolean logic), formatting of responses to selected terminals (including paging capability), message switching and audit data logging. The ability to background test a user system is also provided. Using BTAM, FASTER provides line control support macros of a communication network consisting of IBM 1050, 2740 Typewriter Terminals and the IBM 2260 Display Terminal.

PROGRAMMING SYSTEMS- Written in Basic Assembler Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS- 128K (Note- 256K core storage is highly recommended).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.7.012

FILING AND SOURCE DATE ENTRY TECHNIQUES FOR EASIER RETRIEVAL (FASTER) DOS VERSION

AUTHOR: R. E. Gentry

DIRECT TECHNICAL INQUIRIES TO:
R. E. Gentry
IBM Corporation
Department 868
11141 Georgia Ave.
Wheaton, Maryland 20902

*** N - - 00.6 03.7 05.1 06.3 - - - ***

DESCRIPTION- FASTER (S/360 DOS) (Also know as Gentry Monitor) is a programming system for retrieval and maintenance of "IS" files from terminals. The methods used are applicable to a wide variety of applications. FASTER incorporates a macro-language which provides for writing message processing programs on a functional level. Some of the major functions supported by the language include- Modification and addition to and retrieval from indexed sequential files, data manipulation (including Boolean logic), formatting of responses to selected terminals (including paging capability); message switching and audit data logging. The ability to background test a user system is also provided. Using BTAM, FASTER provides line control support macros for a communication network consisting of IBM 1050, 2740 Typewriter Terminals and the IBM 2260 Display Terminal.

PROGRAMMING SYSTEMS- Written in BAL, FASTER operates as a S/360 DOS foreground job.

MINIMUM SYSTEM REQUIREMENTS- 65K core storage. (Note- 128K core storage is highly recommended).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.7.013
ALPHABETIC NAME SEARCH SYSTEM

AUTHOR: R. A. Root

DIRECT TECHNICAL INQUIRIES TO:
C. L. Thompson
IBM Corporation
100 South Wacker Drive
Chicago, Illincis 60606

*** N - - - - - - - - - - - ***

DESCRIPTION - This is a program for searching an alphabetic name file which is phonetically-keyed. File organization and search techniques are based on sound of search argument, not spelling, retrieves direct hits plus near misses - this catches transcription errors and sound-alike but spelled-different situations. No operator coding. Applicable for information retrieval: insurance, bank, airline, state and local government.

PROGRAMMING SYSTEMS - Body of program is written in COBOL; coding and searching routines in Assembler Language and runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - 65K 360/30 with Disk Operating System, and two 2311 Disk Drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.7.014
KWIC/360 - A KWIC AND KWOC INDEXING PACKAGE FOR SYSTEM/360

AUTHOR: P. L. White

DIRECT TECHNICAL INQUIRIES TO:
P. L. White
IBM Corporation
St. Ann's House, Parsonage Green
Wilmslow, Chesire, England

*** N - - - - - - - - - - - ***

DESCRIPTION - A package of four programs is being prepared which will accept data punched in the standard KWIC format as described in form no. E20-8091 and will produce, at the users option (I) bibliography, (II) author index, (III) permuted title index - KWIC format, (IV) permuted title index - KWOC format, (V) assigned descriptor index. Most of the features of the 1401 program will be provided with, in addition, the ability to delete and replace entries in the bibliography, together with a more comprehensive list of stopwords, up to 255 to be nominated by the user.

PROGRAMMING SYSTEMS - Written in PL/I with Assembler language subroutines; operates using OS/360.

MINIMUM SYSTEM REQUIREMENTS - Include the PL/I Compiler when the system is generated. This is to ensure that the PL/I error handling package, which is called dynamically when it is needed, is present in the System Link Library. The largest program is KWICA with a load module of about 32,000 bytes, plus automatic variables occupying a further 8,000 bytes. Precise storage will depend on options selected, blocking factors, and number of buffers allocated to the various files. It should be possible to run this program in a 44K partition, but many applications will require more. Other programs should run in 44K unless very large blocking factors are used. All programs in the KWIC/360 package are re-entrant.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

*M 360D-06.7.015
A PROGRAM FOR THE MAINTENANCE AND SELECTION OF GROUPS OF CARDS ON THE IBM S/630

AUTHOR: Mr. P. J. Hamilton

DIRECT TECHNICAL INQUIRIES TO:
Mr. P. J. Hamilton
IBM Corporation
Garden State Parkway
Exit 136
Cranford, New Jersey 07016

*** N - - 00.0 - - - - - - ***

DESCRIPTION - This file maintenance and selection program creates and updates files of groups of cards on magnetic tape. The input cards may be in virtually unrestricted EBCDIC form including job control cards, source statements in any language, object module cards, and data cards in any combination. This is made possible by appending control fields (group identification and card number) to the record on tape rather than controlling by the contents of the cards themselves.

PROGRAMMING SYSTEMS - Written in COBOL.

MINIMUM SYSTEM REQUIREMENTS - 32K storage and two tape drives. The program can be easily modified to use disk instead of tape.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.016
MACROS FOR SCANNING AND UPDATING PATIENT MASTER RECORDS

AUTHOR: W. E. Brandt

DIRECT TECHNICAL INQUIRIES TO:
R. W. Kukla
IBM Corporation
1120 Connecticut Avenue
N.W. Washington, D.C. 20036

*** N - - 03.7 - - - - - - ***

DESCRIPTION - Two macros for use in MISP or TESTMISP Application Program give ability to read and write patient master record segments including FIXD, ORD1, ORD2, NOTE, RESU and Overflow Segments in connection with scanning and updating of records in these segments.

PROGRAMMING SYSTEMS - Programming language - DOS/360 Assembly Language and uses certain macros available from MIST and TESTMISP as internal macros. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - CPU features required by MISP or TESTMISP. The minimum machine configuration is a 360/30 F.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.017
ON-LINE RETRIEVAL AND ANALYSIS OF TUMOR REGISTRY DATA (BMDGIL)

AUTHOR: G. Moore

DIRECT TECHNICAL INQUIRIES TO:
G. Moore
Health Sciences Computing Facility
Universtiy of California
Los Angeles, California 90024

*** N - - - - - - - - - - ***

DESCRIPTION - The data base used for this program consists of randomly selected and unidentified records for tumor cases recorded at the UCLA Hospital. Information maintained

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on each patient consists of name, hospital number, age, sex, race, date of diagnosis, date of last followup, status at last followup, site of the tumor, histologic type of tumor, etc. Each of these variables has several values and the values may be arranged in a hierarchy or tree structure. The cases to be observed are selected by means of the light pen on lists of the various values. When the search has been specified, the file is searched and the hospital number and name of each patient who fits the description are displayed on the screen. The cases can be printed out, or rough descriptions of the file can be obtained such as number of cases with each of a selected value of each variable. In addition, subgroups can be specified and survival tables and survival curves constructed.

PROGRAMMING SYSTEMS - This program was written on an IBM System/360 Model 75I, using FORTRAN IV, OS/360 and the GRAF subroutines developed at the Health Sciences Computing Facility. GRAF is a orderable program from PID using program number 360D-03.8.010.

MINIMUM SYSTEM REQUIREMENTS - A 1403 Printer, 2540 Card Reader, and a disk drive, and a 2250 Display Unit having an 8K buffer and a light pen.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-06.7.018
BSEARCH - A RANDOM ACCESS BINARY-SEARCH TECHNIQUE FOR SEQUENTIAL FILES ON DISK OR DRUM

AUTHOR: R. K. Sipherd

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The Boeing Co., Comm. Airplane Div.
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Renton, Washington 98055

*** S BR BSCH - - - - - - - - ***

DESCRIPTION - To search a sequentially organized file on a direct-access device containing fixed length records, blocked or unblocked, by means of a binary-search technique. The desired logical record is placed into user-specified receiving area if it can be found; if it is not found, blanks are put into the area.

When search a large, sequentially organized file on a disk or drum this routine will significantly improve run time by requiring only an absolute minimum number of I/O operations, as opposed to a sequential search which must read on the average, half the file to find the record. Improvement is particularly noticeable in cases where the same file must be searched repetitively.

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language. Timing: Ranges from under 0.25 sec. to about 0.90 sec., depending on device type, number of extents, blocking factor, and file size. See program write-up for optimization techniques.

MINIMUM SYSTEM REQUIREMENTS - Storage required; 1440 bytes for program, plus either 350 bytes or the file blocksize, which ever is larger.

NOTES: Currently implemented only for 2311, 2314, and 2301 devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.019 *M
KWADE - KEYWORD AS A DICTIONARY ENTRY

AUTHOR: H. P. Sieglaff

DIRECT TECHNICAL INQUIRIES TO:

CONTINUED FROM PRIOR COLUMN

H. P. Sieglaff
3610 W. Northview
Phoenix, Arizona 85021

*** S MMC IJKW 06.6. - - - - - ***

DESCRIPTION - These FORTRAN subroutines generate KWOC and left justified KWIC output from a character string supplied by the user.

The output can vary in size as follows:
OUTPUT record - INPUT record + maximum size keyword + 2
OUTPUT record must be less than or equal to 256 characters.
The subroutines can be used to process titles and/or keywords of articles of a journal.

PROGRAMMING SYSTEMS - The subroutines were tested using OS FORTRAN Language 4 G Level, OS FORTRAN Language 4 H Level, and OS Version 13 on a S/360 Model 50.

MINIMUM SYSTEM REQUIREMENTS - 4K bytes of core are required in addition to means of getting information into and from core (e.g. card reader, CRT, disk, drum, printer or tape). The package should work on any S/360 machine which has FORTRAN IV G and OS. (Maximum core requirement is 1K).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.020 *M
TEXT-PAC, A S/360 NORMAL TEXT INFORMATION PROCESSING, RETRIEVAL, AND CURRENT INFORMATION SELECTION SYSTEM

AUTHORS: M. Esposito A. V. Fleisher
R. Griedman, S. D. Kaufman
S. Rogers S. Skyl
S. Shotkin

DIRECT TECHNICAL INQUIRIES TO:
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ITIRC
IBM Corporate Headquarters, Dept.10-771
Armonk, N.Y. 10504

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DESCRIPTION - TEXT-PAC is a system that provides a natural text information processing, dissemination, and retrieval capability. The system provides facilities for editing and correcting input data, and generating reports and indexes, including KWOC's. Provision is made for conversion of data prepared by the IBM 7090-1401 Current Information Selection and Retrospective Searching System (File Number 7090 IBM 0036) to this IBM 360 System.

PROGRAMMING SYSTEMS - The programs were written in BAL and operate under OS/360 (MVT or MFT).

MINIMUM SYSTEM REQUIREMENTS - The TEXT-PAC system requires a 256K System/360, a card reader, a printer, four 9-track tape drives, one 7-track tape drive (if 1401 input is used) and one direct access device (temporary storage) in addition to system requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.7.021 *M
AUTORAF - A SYSTEM FOR BUILDING AND USING RECORD ADDRESS FILES FOR DIRECT PROCESSING OF FILES ON SYSTEM/360

AUTHOR: J. Hetland

DIRECT TECHNICAL INQUIRIES TO:
J. Lind
1133 Westchester Avenue
White Plains, New York 10601

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DESCRIPTION - AUTORAF is a system for processing subsets of a file in different sequences. It includes (1) exit routines for a 360 sort to load the file onto disk and simultaneously build up to 20 Record Address Files (RAF's) according to user specifications, and (2) subroutines which use the RAF's to read the selected records from the disk and present them to a PL/1 or Assembler program in the desired sequence (RPG can also be used, since it has built-in RAF facilities). A 360 program that reads a sequential file can be easily modified to use AUTORAF subroutines, thus eliminating preliminary extractions and sorts.

PROGRAMMING SYSTEMS - Written in Assembler language, and can be assembled and run on any 360 having OS, Assembler.

MINIMUM SYSTEM REQUIREMENTS - A card reader, printer, 4 tape drives (or 1 tape drive and DASD's for sort work files), and enough DASD's to contain the source file.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.022
OS/360 QUIC (KWIC INDEXING)

AUTHOR: J. A. Starkweather
R. Karpinski

DIRECT TECHNICAL INQUIRIES TO:
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Computer Center-760
University of California Medical Center
San Francisco, California 94122

*** S VCS VER2 00.0 035 06.1 06.6 - - - ***

DESCRIPTION - QUIC produces KWIC indexes for a variety of purposes. Many options permit modifying various aspects of the process and results. The program is run as a three step job: INPUT-(PL/I), SORT-(OS/360 SORT-MERGE), OUTPUT-(PL/I).

PROGRAMMING SYSTEMS - Written in PL/1F for OS/360.

MINIMUM SYSTEM REQUIREMENTS - Approximately 100K bytes are used but the program requires no special equipment.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.7.024
GENERATION DATA GROUP (GDG) MODIFICATION

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
D. Jacobs
Martin Marietta Coporation
P.O. Box 5837 MP-423
Orlando, Florida 32805

*** N - GDG 01.4 - - - - - - ***

DESCRIPTION - Generation Data Group (GDG) Modification is a modification of OS so as to allow the programmer to specify a Relative Generation Number (RGN) higher than "0" and have it default to "0" if the higher number does not exist. Type 1 code would cause a system completion code of "813" if it could not find the RGN. Thus, references tc an RGN of "(+1)" in a catalogued procedure with a "DISP=OLD" would not have to be overridden if a restart is to be made past the step that created the data set with an RGN of "(+1)". One routine is modified to produce the above result, namely "IEFVM3LS" (GDG Processing). The modifications increased "IEFVM3LS" by 41 bytes.

PROGRAMMING SYSTEMS - These modifications have been tested utilizing MVT, Release 15/16. However, they should also work with MFT II since the Type I module is the same in both systems. Written in Assembler language level F.

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MINIMUM SYSTEM REQUIREMENTS - The same as those required for running OS, MVT and/or MFT II.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067024

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.7.025 *N
MISP LABORATORY REQUISITION SYSTEM

AUTHORS: R.L. Winner E.J. Verhey R. Yagoda

DIRECT TECHNICAL INQUIRIES TO:
Director of Data Processing
Monmouth Medical Center
Long Branch, New Jersey

*** N - - - - - - - - - - ***

DESCRIPTION - This series of programs create and maintain a laboratory order in a Patient Master Record; produce computer prepared laboratory test request form; yield workload schedule and specimen status reports. Positive specimen identification is achieved at bedside and maintained throughout. The machine readable specimen identification medium provides for automated laboratory specimen processing capability. Collection from universality allows a graceful degradation from fully automated status (computer produced forms and processing) to manual (handwritten) processing. The programs are initiated by an IBM 1092 Programmed Keyboard transmission.

PROGRAMMING SYSTEMS - ALP utilizing Medical Information System Programs (MISP) facilities.

MINIMUM SYSTEM REQUIREMENTS - The same as for MISP with a minimal 15K application area within MISP.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D067025

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-06.8.002 *N
LPI

AUTHOR: D. Ritchie

DIRECT TECHNICAL INQUIRIES TO:
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Computing Center
Washington State University
Pullman, Washington 99163

*** S UY - - - - - - - - ***

DESCRIPTION - LPI is a small set of subprograms for use by FORTRAN programmers to perform the basic functions of list processing. This paper describes and evaluates LPI, comparing it specifically with SLIP, a similar system.

PROGRAMMING SYSTEMS - Operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - LPI requires only sufficient hardware to compile and execute FORTRAN programs.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D068002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-06.8.003 *N
THE DATA STRUCTURES PROGRAMMING SYSTEM

AUTHOR: F.W. Tompa

DIRECT TECHNICAL INQUIRIES TO:
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Center for Computer & Information Sciences
182 George Street
Providence, R.I. 02912

*** S BUC - 01.6 03.2 03.8 - - - - ***

DESCRIPTION - The Data Structures Programming System (DSPS) allows a user to build and manipulate complex data (list) structures. The structures, written in the Data Structures Programming Language (DSPL) and translated into Assembler Language by a compiler, are designed completely by the user in order that they may best fit his particular application. The run-time paging component permits the structure to be arbitrarily large while imposing only minimal manipulation handicaps on the user.

Users of DSPS include those who need to design powerful data structures optimized for run-time speed. DSPL is completely compatible with Assembler Language in order to permit a user to conveniently intermix simple arithmetics, shifts, etc. for manipulating data.

MINIMUM SYSTEM REQUIREMENTS - DSPS was written for a System/360 Model 50 or higher, using 2314 or 2311 direct access devices (disks) for secondary storage.

PROGRAMMING SYSTEMS - It has been run under Releases 14, 15/16, and 17 of the 360 Operating System, using both MVT and MFT. The program is written in System/360 Assembler Language and has been tested under IBM's Assembler F and Waterloo's Assembler G.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D068003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-07.3.001
FREEFORM INPUT FOR BAX FORTRAN FOR REALS AND INTEGERS

AUTHOR: Elaine Yox

DIRECT TECHNICAL INQUIRIES TO:
Elaine Yox
Bell Aerosystems Co.
Dept. 181, P. O. Box 1
Buffalo, New York 14240

*** N - - 40.1 - - - - - - ***

DESCRIPTION - The routines IN1 and IN2 are designed to enable users to input unformated (freeform) data, either following their programs with their input file (unit 5 input) or under conversional input (unit 9 input). These routines are referenced in FORTRAN programs through the presence of the appropriate call statements. IN1 reads data into an array (of one or two or three dimensions, according to standard, FORTRAN IV, array storage scheme), IN2 reads data into distinct locations specified in the calling sequence.

PROGRAMMING SYSTEMS - Written in BAP.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 or above.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D073001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-07.3.002
OS/360 FORTRAN BLANK INPUT FIELD DETECTOR

AUTHOR: Mr. W. G. Dwyer

DIRECT TECHNICAL INQUIRIES TO:
Mr. W. G. Dwyer

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Boston College
Computing Center
Chestnut Hill, Massachusetts 02167

*** N - - 06.5 13.0 - - - - - -***

DESCRIPTION - This FORTRAN IV subprogram allows the FORTRAN programmer to determine whether input fields read under "F" format contain data or are actually blank. The routine accomplishes this by converting all-blank fields to internal floating-point negative zeros. All non-blank fields read under "F" format are converted normally, save that non-blank fields which would ordinarily be converted to -0. are converted instead to plus 0., to prevent their being confused with blank fields. The routine requires about 350 (decimal) bytes of object-time storage, and will function with any version of the OS FORTRAN G/H Library in which the linkages between modules IHCFCOMH and IHCFCVTH are the same as in OS Release 13. The routine is intended primarily to aid statistical programmers, who must often be able to distinguish between missing and zero observations on input.

PROGRAMMING SYSTEMS - Written in FORTRAN Assembly Language (level-F).

MINIMUM SYSTEM REQUIREMENTS - Those needed to run OS FORTRAN IV.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D073002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-07.3.003
ASSEMBLY LANGUAGE SUBROUTINES PROVIDING CONSOLE INPUT FOR FORTRAN

AUTHOR: C. T. Osburn II

DIRECT TECHNICAL INQUIRIES TO:
C. T. Osburn II
Mooney Corporation
Engineering Department
P.O. Box 72
Kerrville, Texas 78028

*** C 5421 - 01.0 12.1 - - - - - ***

DESCRIPTION - Subroutines DECIDE and TYPEIN provide console input for FORTRAN. A call to DECIDE unlocks the 1052 Console Keyboard and allows the operator to type in a one-digit response. The resulting integer value is returned through the argument and may be tested or used as a normal FORTRAN integer. A call to TYPEIN allows the operator to type in up to 80 columns of data. The argument string passed may be any length and may contain both integer and floating point variables. The operator types in values for the arguments and TYPEIN converts and returns them to the calling program. Floating point is returned when the value entered contains a decimal point, integer is returned when no decimal point is entered. Provisions have been made to leave any or all of the arguments unchanged when desired.

PROGRAMMING SYSTEMS - Written in 360 Basic Assembler Language and runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required to run DOS/360, with 1052 Printer/Keyboard.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D073003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-07.5.001
IBM 1285/1287 OCR PROGRAMMING SUPPORT UNDER OS/360

AUTHOR: Mr. W. H. Anderson

DIRECT TECHNICAL INQUIRIES TO:
Mr. W. H. Anderson
IBM Corporation
112 East Post Road
White Plains, New York 10601

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*** N - - 03.7 - - - - - - -***

DESCRIPTION - This program furnishes OS/360 support for the IBM 1285/1287 Optical Character Readers. The package provides the user with nine macros which can be included in his S/360 Assembly Language programs when coding for the IBM 1285/1287 devices. The package also includes nine program modules to execute the functions of the specified macros. Two SVC routines for the IBM 1285/1287 are provided for error recovery under OS/360. Information provided includes detailed instructions for SYSGEN functions.

Document reading is supported on the Read/Write (BSAM) level. Journal roll reading is supported on both the Read/Write (BSAM) and Get/Put (QSAM) levels. Two sample problems are provided for use with journal tapes and documents. These programs were tested using Release 14 of OS/360. Two OS/360 Environments were used for test purposes, i. e., PCP with S/360 Model 30 with 65K of core storage and MVT with S/360 Model 40 with 256K of core storage. The support is designed to run in a time independent PCP, MFT or MVT environment. Multiple optical character readers can be attached to a single system with this support.

PROGRAMMING SYSTEMS - The operating system required is OS/360.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30 with 65K of core storage and OS/360 PCP option, plus a minimum number of I/O devices required to run a minimal OS/360 configuration and an IBM 1285/1287 optical reader device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D075001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-07.6.001
2741 READ AND WRITE ROUTINE

AUTHOR: D. Christian

DIRECT TECHNICAL INQUIRIES TO:
D. Christian
IBM Corporation
1371 Peachtree Street, N.E.-Rm.200
Atlanta, Georgia 30309

*** N - - 03.4 - - - - - - ***

2741 DESCRIPTION - A program to read and write to an IBM 2741 Communications Terminal that runs under 360 OS, Language (Assembly, PL/1, FORTRAN, COBOL) can call this program and pass or receive a message (in EBCDIC). The program is at Executive Channel Program Level. There is no error recovery coding in the program.

PROGRAMMING SYSTEMS - Written in OS 360 Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Configuration required for OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D076001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.0.001
HEAR/360

AUTHOR: Mr. N. Smay

DIRECT TECHNICAL INQUIRIES TO:
Mr. N. Smay
IBM Corporation
1371 Peachtree Street, N. E.
Atlanta, Georgia 30309

*** N - - - - - - - - - -***

DESCRIPTION - HEAR/360 is an inquiry answering program for System/360 and the IBM 7770 Audio Response Unit. The program is very general in nature and is tailored to any

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application through the use of user built tables. The program accepts input inquiries, checks these inputs for validity, interprets the question, references disk data files, composes responses, and updates the data files when required. There are no restrictions to number of audio lines, number at data files, message lengths, or vocabulary.

PROGRAMMING SYSTEMS - The program is written in 360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS II and BTAM.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D080001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.0.003
WRIMAT MATRIX WRITER

AUTHORS: R. A. Usanis H. E. Schaffer

DIRECT TECHNICAL INQUIRIES TO:
R. A. Usanis
Dept. of Genetics
N.C. State University
Raleigh, North Carolina 27607

*** S NCS - 45.0 - - - - - - ***

DESCRIPTION - This subroutine prints large matrices in easily readable form. Given a matrix stored in singly or doubly subscripted form, Subroutine WRIMAT will print the matrix in rectangular, upper triangular, or lower triangular form depending on the arguments passed from the calling program. The output is divided into pages with a maximum of nine columns and 27 rows per page. Each page is titled, the rows and columns are numbered and the rows are double spaced. Triangular matrices can be printed only as stored and are printed with their main diagonal. The output for any shape matrix will be such that the pages can be arranged together to form the entire matrix.

PROGRAMMING SYSTEMS - Written in FORTRAN IV G and tested on Release 11 and 14 of OS/360.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360. Uses approximately 3330 bytes of memory. A maximum of 132 print positions are used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D080003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.001
PLOTS - A SUBROUTINE FOR TIME-SERIES PLOTTING ON A PRINTER

AUTHOR: Mr. R. H. Karpinski

DIRECT TECHNICAL INQUIRIES TO:
Mr. R. H. Karpinski
University of California
Medical Center
110 M. R. -4
San Francisco, California 94122

*** S UCS PLTS 03.8 - - - - - - -***

DESCRIPTION - To use "PLOTS" to plot n curves - Call PLOTS (-n, ranges) where n equals number of curves (this argument should be negative for the setup call, causing a new plot to be started), and ranges equals an array of size 3n plus 3:

- ranges (1) - time zero (time of beginning of plot).
- ranges (2) - delta time (time increment per plot line).
- ranges (3) - 1(time will be printed every 1 lines, unless 1 is less than zero).
- ranges (4) - x(1)min. (minimum value to be plotted for first curve).
- ranges (5) - x(1)max. (maximum value to be plotted for first curve).
- ranges (6) - x(1)char. (character to be plotted to indicate first curve).

CONTINUED FROM PRIOR PAGE

- ranges (3n plus 1) - x(n) min.
- ranges (3n plus 2) - x(n) max.
- ranges (3n plus 3) - x(n) char.

For each line desired (i.e. call "PLOTS" many times once for each time increment), call PLOTS (n,x) where n equals the number of curves and x(i) equals the current value of the Ith curve. "PLOTS" will actually plot a value up to, but not including, max. plus (max-min) *0.01 in the 101st position. N should be between 1 and 100.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.002
INTERFACE BETWEEN PL/I USER PROGRAMS AND CALCOMP ROUTINES

AUTHOR: Mr. E. H. Remy

DIRECT TECHNICAL INQUIRIES TO:
Mr. E. H. Remy
Eastman Kodak Co.
Bldg. 56, Kodak Park
Rochester, New York 14650

*** S KP PLOT 03.8 03.0 - - - - - -***

DESCRIPTION - The OS/360 plotting routines provided by CALCOMP are written in FORTRAN and Assembler and are designed to be used by a FORTRAN program. These routines may be called by a PL/I program but such use does not permit some commonly used PL/I features such as character strings. It is also an inconvenience for a PL/I programmer to adhere to FORTRAN linkage conventions such as avoiding passing DOPE vectors. To permit the PL/I programmer to use straight-forward PL/I statements in plot programs, this interface has been written to intercept the linkage between the users program and the routines provided by CALCOMP. Linkage editor "change" cards are used to permit the interface to have entry points with the same names as the routines provided by CALCOMP. The JCL may be modified to conform to an installations procedures and naming conventions.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMIM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.003
PLOT - A SUBROUTINE FOR PLOTTING ON A PRINTER

AUTHOR: Mr. L. Israel

DIRECT TECHNICAL INQUIRIES TO:
Mr. L. Israel
Air Products & Chemicals, Inc.
P. O. Box 538
Allentown, Pennsylvania 18105

*** S APC - - - - - - - - -***

DESCRIPTION - The subroutine PLOT is used for plotting on a printer. It will print one to nine sets of dependent variables against an independent variable, and/or a curve of calculated values.

PROGRAMMING SYSTEMS - Written in basic FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.005
IBM 1780 (GEOSPACE) PLOTTER SUBROUTINE FOR OS/360

AUTHOR: C. M. N. Cree

DIRECT TECHNICAL INQUIRIES TO:
C. M. N. Cree
IBM Corporation
Scientific & Industry Devel. Ctr.
6900 Fannin
Houston, Texas 77025

*** S IH JPLT1 00.0 - - - - - - ***

DESCRIPTION - An IBM System/360 FORTRAN-callable subroutine which permits the user to write data from main core to the IBM 1780 (Geospace) plotter independent of timing considerations, and to issue assorted control commands to that device. The subroutine accepts data in 200 to 64,000 byte blocks, normally from alternate buffers, and permits overlapped processing.

PROGRAMMING SYSTEMS - The program is written in Operating System Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - 131K, but can easily be modified to run in 65K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.007
IBM 1780 ALPACA ENPLT ROUTINE FOR OS/360 MVT

AUTHOR: C. M. N. Cree

DIRECT TECHNICAL INQUIRIES TO:
C. M. N. Cree
IBM Corporation
6900 Fannin
Houston, Texas 77025

*** N - - 00.0 - - - - - - ***

DESCRIPTION - This is an OS/360 serially reusable program which may be called as a subroutine or executed as an independent job step in the same way as its namesake distributed as part of the OS/360 ALPACA package. Unlike its namesake, however, this program will produce correct ALPACA plots on any model of System/360 running OS PCP, MFT, or MVT whether the IBM 2311 (or 2314) input device is on different channel from the IBM 1780 or not. The program uses two input buffers whose sizes may be varied by conditional assembly.

PROGRAMMING SYSTEMS - The program is written in System/360 OS Assembly Language and requires the use of the OS Plotter Subroutine for the IBM 1780 Model 2 Plotter (Type III Program, Order No. 360D-08.6.005).

MINIMUM SYSTEM REQUIREMENTS - Any model S/360 running OS PCP, MFT, or MVT whether or not the 2311 (or 2314) input device is on a different channel from the IBM 1780.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.008 *M
SUBROUTINE GRAPH

AUTHOR: G. H. Fricke

DIRECT TECHNICAL INQUIRIES TO:
G. H. Fricke
U.S. Atomic Energy Commission
Health & Saftey Lab. Fellow
Clarkson College of Technology
Potsdam, New York 13676

*** N - - 17.0 44.0 00.0 16.0 - - - ***

DESCRIPTION - Subroutine GRAPH is written in FORTRAN IV and has been tested on an IBM S/360 Model 44 using a 2540 Card Reader and a 1403 Printer. The total storage (memory) requirements is 1728 bytes. The subroutine will plot a function with or without experimental data. One unique feature of this subroutine is that it is internally independent of the function being graphed. Therefore any function which can be written as - variable Y equals function of variable X.

May be plotted without introducing the function into the subroutine.

The subroutine may be called many times during the main program and may plot any number of different functions within the same main program. This allows the programmer to see data fitted to various curves or to see how changing some nctation in an equation changes the shape of the curve. An example would be to successively least squares fit data to increasing degree polynomial equations to see which equation visually best fits the data. The subroutine has been used successfully by physics, chemistry and engineering personnel for various problems. This method of graphing, i.e. on the printer, has a great advantage over an expensive, time consuming on-line printer.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.011 *N
PNRG, PERSPECTIVE PLOTTING RCUTINE, ARBITRARY GRID

AUTHOR: B. Kubert

DIRECT TECHNICAL INQUIRIES TO:
M. Barling
Aerospace Corporation
P.O. Box 5866
San Bernardino, California 92408

*** S ASB PNRG - - - - - - - - ***

DESCRIPTION - This subroutine generates perspective plots of curves and surfaces. The surfaces represent functions of two variables, f(x,y), which satisfy certain restrictions. As an option the surfaces may be taken to be opaque, in which case all hidden lines are eliminated. The input data for a surface are the mesh points of two families of curves lying on the surface. They are given in three arrays, one containing x-coordinates, one containing y-coordinates, and the other containing z-coordinates of the mesh points. The input data for a curve is a set of consecutive points lying on the curve. PNRG is a modification of a subroutine written by J. Szabo and S. Giulieri. It is compatible with FORTRAN H, however, it has only been checked out on FORTRAN G.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - The program was run on an IBM 360-IH65 using less than 270K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.012 *N
PRG, PERSPECTIVE PLOTTING ROUTINE, RECTANGULAR GRID

AUTHOR: B Kubert

DIRECT TECHNICAL INQUIRIES TO:
M. Barling
Aerospace Corporation
P.O. Box 5866
San Bernardino, California 92408

*** S ASB PRG - - - - - - - - ***

DESCRIPTION - PRG is an OS/360 FORTRAN subroutine which generates perspective plots of curves and surfaces. The surfaces represent functions of two variables, f(x,y), which satisfy certain restrictions. The plot of a surface is constructed from two families of curves on the surface, one family having curves on the surface, one family having curves with fixed x coordinates, the other family having curves with fixed y coordinates. The plotting of the latter can be suppressed. The surfaces can be rotated or translated. As an option the surfaces may be taken to be opaque, in which case all hidden lines are eliminated. The input data for the surface is given in five arrays which contain the starting x and y values, the x and y increments and the z values. The input data for a curve is a set of consecutive points lying on the curve. This program replaced PRG (D003A). This subroutine is a modification of a program originally written by J. Szabo and S. Giulieri. It is compatible with FORTRAN H, however, it has only been checked out on FORTRAN G.

PROGRAMMING SYSTEMS - Written in OS/360 FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - The program was run on an IBM 360-IH65 using less than 270K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.6.013 *N
PLT360, IBM 1627 PLOTTING ROUTINE

AUTHOR: Maureen Clark

DIRECT TECHNICAL INQUIRIES TO:
Mary Barling
Aerospace Corporation
P.O. Box 5866
San Bernardino, California 92408

*** S ASB PLT360 - - - - - - - ***

DESCRIPTION - This routine will plot from one to seven dependent variables vs. an independent variable from user-supplied information. PLT360 is on the S/360 Library. All calls from FORTRAN are to PLT. Subroutines PLT1 and PLTW are called by PLT. PLT360 is the OS/360 Assembler language version of the 7040-7094 DCS routines PLT(AM01B), PLT1(AM10A), and PLTW(AM11A), which were major revisions of RW CCP and RW CCP2, written by K. G. Tomikawa and J. R. Blackmer, respectively, in August of 1962, at Space Technology Laboratories, Redondo Beach, Califcrnia.

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Total storage required (bytes) is 236C(16) or 9046(10). This program was run on an IBM 360-IH65.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D086013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.7.001 *M
GRAPHIC FORTRAN SYSTEM FOR THE IBM 2250 DISPLAY UNIT

AUTHOR: D. A. Hollo

DIRECT TECHNICAL INQUIRIES TO:
D. A. Hollo

CONTINUED FROM PRIOR PAGE

IBM Corporation
IBM Building, Gateway Center
Pittsburgh, Pa. 15222

*** N - - 00.6 03.8 06.5 - - - - ***

DESCRIPTION - A collection of 80 graphic subroutines to allow the FORTRAN programmer to easily make use of the IBM 2250 Display Unit in an application program. The system requires a single, dedicated IBM 2250 Model 1 Display Unit with buffer storage, Character Generator and Absolute Vector features. Included are routines for initialization, attention handling from the function keys and light pen, image generation, scaling; routines to generate grids, circles, line class, dimension lines, geometric solution and a 3-D display system.

PROGRAMMING SYSTEMS - The hardware dependent routines are written in Basic Assembly Language and the hardware independent routines are written in FORTRAN IV Level D. The subroutines are used with BPS FORTRAN IV Tape 16K.

MINIMUM SYSTEM REQUIREMENTS - The GFS tape embodies all the features of FORTRAN IV BPS, Level D, Tape 16K, and supports a single 2250 Model 1 Display Console which must be equipped with 4K or 8K buffer, the Character Generator, and the Absolute Vector feature. The system will run on any System/360 Model 30 or higher, having 64K or more, equipped with 1052 Terminal, card-reader punch, either 2540 or 1442, 1403 Printer and four tape units. Optional features supported are the light pen, the function key and the indicator lights.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - FORTRAN system tape with the GFS subroutines in the system library.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code, and is specified by using program number extension LIST. One autochart tape, and is specified by using program number extension FLOW.

ORDERING INFORMATION: PROGRAM NUMBER 360D087001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	LIST	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01
	FLOW	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360D-08.7.002
GPAK - ONE-LINE GRAPHIC DATA PROCESSING SOFTWARE SYSTEM WITH REAL TIME 2250 MODEL 1 INPUT AND DISPLAY

AUTHOR: H. Wolpe, D. Christiansen, H. Hogset, D. Mokski, R. Wrenn, R. Armstrong, H. Ganske, A. Lippert, S. Starr

DIRECT TECHNICAL INQUIRIES TO:
R. A. Armstrong
IBM Corporation
9045 Lincoln Blvd.
Los Angeles, Calif. 90045

*** N - - 00.6 03.8 - - - - - ***

DESCRIPTION - GPAK (Graphic Package) is a set of subroutines which provides support for the IBM 2250 I Display Console. It utilizes OS/360 Express Graphics Support. GPAK assists the 2250 I user in the following areas- Attention handling image generation (creation of 2250 orders), graphic data management, light pen handling and console procedures. GPAK routines may be called from both Assembly Language and FORTRAN. GPAK is a modular and open ended system allowing the application programmer to select from a set of generalized tools or create his own. A program will be provided that serves as an installation test program.

PROGRAMMING SYSTEMS - Runs under OS/360, and utilizes OS/360 Express Graphics Support.

MINIMUM SYSTEM REQUIREMENTS - At least a 64K S/360 Model 30 which can run OS/360 and a 2250 Model I with buffer, Character Generator and Absolute Vector features.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D087002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

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360D-08.7.003
HISTOGRAM DISPLAY SUBROUTINE

AUTHOR: D. Ashler

DIRECT TECHNICAL INQUIRIES TO:
D. Ashler
University of Pennsylvania
Wharton School
Philadelphia, Pa. 19104

*** S CUP HIST 08.6 - - - - - - ***

DESCRIPTION - Subroutine HIST may be called to obtain the mean, standard deviation, quartiles, and a histogram of a distribution. The call must supply the name and the length of a one-dimensional array of REAL*4 numbers; HIST sorts these numbers in place, subdivides their range into fourteen equal intervals, and prints a 14-bar histogram on a single page. The mean and the quartile boundaries are marked on the histogram. The values of the fourteen frequencies are printed above it; the values of the interval boundaries and of the mean, quartile boundaries, and the standard deviation are printed below it. Provision is also made for displaying a legend at the bottom of the page and in the upper left corner.

PROGRAMMING SYSTEMS - Utilizes OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D087003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.7.004
INTERSECTION DETECTION IN THREE DIMENSIONS - A TOOL FOR COMPUTER AIDED ENGINEERING DESIGN AND GRAPHIC DISPLAY

AUTHOR: P. G. Comba

DIRECT TECHNICAL INQUIRIES TO:
P. G. Comba
IBM Corporation
N.Y. Scientific Center
590 Madison Ave.
New York, N.Y. 10022

*** S ISR - 16.1 16.3 16.5 - - - - ***

DESCRIPTION - The Intersection Detection program(ID/3D) is a system of FORTRAN subroutines that enables the user to - Define 3-dimensional convex objects bounded by planes and quadric surfaces - Define line segments in 3-space - Test for intersections between pairs of objects - test for intersections between segments and objects. The program is primarily a tool for the solution of pipe routing and component placement problems. The segment-object intersection test can also be used to solve the hidden line problem in computing graphic displays of 3-dimensional objects.

PROGRAMMING SYSTEMS - Can run under OS/360 or BPS.

MINIMUM SYSTEM REQUIREMENTS - Requires 128K core storage. (Note- the amount of core needed for compilation and linkage editing depends on the version of the compiler and linkage editor being used. The program has been compiled and tested under BPS with 128K storage, and under OS FORTRAN G and FORTRAN H levels with 512K storage).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D087004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-08.7.005 *M
SYSTEM/360 UNIFORM CRIME REPORT - NATIONAL SAFETY COUNCIL REPORT SYSTEM FOR LAW ENFORCEMENT

AUTHOR: G. G. Walker

DIRECT TECHNICAL INQUIRIES TO:
G. G. Walker
IBM Corporation
1111 Connecticut Ave. N.W.
Washington, D.C.

*** N - - 06.7 27.0 - - - - - ***

DESCRIPTION - The System/360 Uniform Crime Report - National Safety Council Report System for law enforcement produces the standard UCR-NSC reports for municipal and state police organizations. Included are data set generation, update and reporting programs. The reports which may be prepared are UCR - return A, B, and C, supplement to return A, the age, sex, and race reports, the juvenile disposition reports and the standard summary of Motor Vehicle Traffic Accident Report.

PROGRAMMING SYSTEMS - The system is written in Basic Assembler Language and runs under DOS.

MINIMUM SYSTEM REQUIREMENTS - 32K, one 3211, one card reader and one printer (132 positions).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D087005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC		DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-08.7.006
SPLOT - ONE PAGE GRAPH-PRINTING SUBROUTINE

AUTHOR: D. Ashler

DIRECT TECHNICAL INQUIRIES TO:
D. Ashler
University of Pennsylvania
Wharton School
Philadelphia, Pa. 19104

*** S CUP SPLT - - - - - - - ***

DESCRIPTION - Subroutine SPLOT constructs and prints a one-page graph on a printer, e.g., IBM 1403, that is normally set up to print ten characters per inch horizontally, 132 characters per line, at a vertical line spacing of six lines per inch. Multiple entries are used to provide maximum flexibility. An area of memory simulates the graph pape. It is initialized to all blanks. Maximum and minimum values of the two variables are supplied for scaling purposes. Points are plotted by replacing the blanks with any desired characters. When the graph is complete, a call to graph prints it out, together with legends at bottom and at upper left if desired. A set of points to be plotted is supplied in the form of two arrays, one of abscissas and one of ordinates; several sets of points may be plotted, each set with a different character. If desired, the points will be printed out superimposed on a grid, or enclosed in a box, with scale values printed along the left edge and bottom. Axes are also optional. Coordinates may be supplied in single or double precision. SPLOT may be used to print pictures, graphs of equations, scattergrams, etc.., however, for histograms, HIST is recommended.

PROGRAMMING SYSTEMS - Runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D087006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-08.8.003
PROGRAM TO ESTIMATE THE AMOUNT OF CPU TIME AVAILABLE IN THE FOREGROUND FOR PROGRAMMING

360D

CONTINUED FROM PRIOR COLUMN

AUTHOR: S. Auerbach

DIRECT TECHNICAL INQUIRIES TO:
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New York, N.Y. 10017

*** N - - 02.0 04.4 - - - - - ***

DESCRIPTION - This program will help the user evaluate potential foreground programs. The program calculates the amount of foreground wait time. This is time available to the background partition for processing. A DOS MP system is required. The analysis program runs in the background partition and uses the timer for time of day. (The computer must have the Timer hardware feature, but the user's supervisor must support the Interrupt Key.

PROGRAMMING SYSTEMS - The program is written in DOS SLP and DOS COBOL E and operates under DOS. The console typewriter is the only I/O device used.

MINIMUM SYSTEM REQUIREMENTS - The standard minimum 10K background area is sufficient. The program has been used to demonstrate DOS multiprogramming.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D100001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-10.0.002
FORTRAN ANALYSIS PROGRAM

AUTHOR: I. M. Miller

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*** N - - 12.2 00.2 04.2 - - - - ***

DESCRIPTION - The Analysis program generates five tables including block definition, variable cross reference, and precedence tables for FORTRAN programs. One can use these tables to hand generate flowcharts and hand translate FORTRAN programs to other languages. These tables also are useful in debugging and modifying executable FORTRAN programs. With a change in the scanning routines, one could adapt this program to COBOL, Assembly language or any other computer language. The program has been tested in over 100 FORTRAN programs.

PROGRAMMING SYSTEMS - The program has been written in Assembly Language, and runs under any OS/360 Operating System.

MINIMUM SYSTEM REQUIREMENTS - A 128K system with two disk drives, and requires 90K bytes of storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D100002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-10.1.001
TELEPROCESSING DISTANCE AND LINE COST CALCULATION PROGRAM

AUTHORS: P. M. Junemann D. F. Healy

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
6900 Fannin Street
Houston, Texas 77025

*** N - - 16.0 17.0 41.5 - - - ***

CONTINUED FROM PRIOR PAGE

DESCRIPTION - This is a program that can be run on the IBM System/360, 1130, 7090, and other computers that have a FORTRAN IV Compiler. The program calculates and tabulates the distances and the common carrier line costs between 50 (or less) cities. The input is the vertical and horizontal coordinates of the cities as obtained from the AT&T FCC Tariff 255, and line charges from the appropriate tariff for the line grade used. The output is a printed table of the distances and line costs between each of the input cities. The program has the ability to output a distance-only table and also a combination distance-line cost table. The program greatly assists in the preliminary or manual design of a small (50 cities or less) communications network.

PROGRAMMING SYSTEMS - Written in FORTRAN II.

MINIMUM SYSTEM REQUIREMENTS - The system used to execute the program must have an on-line (or peripheral) card reader and printer (120 print positions or larger). A 32K S/360, or an 8K-1130 are large enough to execute the program. To alter this program to run on a specific machine, only two statements in the source deck need to be changed; to change the logical designation for the input and output units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D101001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-10.2.001
ISA360 - INDEX SEQUENTIAL ANALYZER

AUTHOR: W. E. Messmann

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
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*** N - - 01.6 04.3 - - - - - ***

DESCRIPTION - The purpose of Index Sequential Analyzer 360 is to easily recognize the implication of blocking factor and cylinder overflow in determining file space requirements for the Index Sequential File Management System. With a single input card describing the device, number of records, record length and key length, ISA360 prints out the number of records possible on a cylinder and number of cylinders required for the whole file with various combinations of blocking factors and cylinder overflow. An analysis such as that provided by ISA360 is a necessity in avoiding arbitrary or poor choices of blocking factor in particular, and this can prove especially expensive both in file space requirements and performance. The program is also useful for judging the effect of changes in record and/or key length. ISA360 is also used to help decide between the 2311, 2321, 2314 and 2302 in configurating S/360. The Assembler Language source deck is easily modified to any S/360 Model 30 or larger with any card reader and any printer under any operating system.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Runs on an 8K S/360 Model 30 with Standard Instruction Set, a 2540, and a 1403.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D102001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-10.2.002
DISK AND CORE REQUIREMENT ANALYZER FOR THE S/360 BILL OF MATERIAL PROCESSOR.

AUTHOR: J. F. Vandeveer

DIRECT TECHNICAL INQUIRIES TO:
J. F. Vandeveer
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22720 Michigan Ave.
Dearborn, Mich. 48124

CONTINUED FROM PRIOR COLUMN

*** N - - 01.6 06.7 24.2 - - - - ***

DESCRIPTION - The Disk and Core Requirement Analyzer for the System/360 Bill of Material Processor consists of two programs. The first program analyzes master file requirements, and the second program analyzes chain file requirements. These programs follow closely the analysis presented by the flowcharts in appendix E of the System/360 Bill of Material Processor Programmers Manual (H20-0246). These programs provide no single, definite solution, but instead a number of possible solutions which are presented in tabular form. The user can analyze and weigh the advantages of one solution over another and arrive at the optimal solution tailored to his needs and hardware configuration. These programs save many hours of manual calculation which normally would not be performed to arrive at the optimal solution for a particular installation.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Will run on either an IBM 1130 or System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D102002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-10.2.003
SPACE REQUIREMENTS FOR AN INDEXED SEQUENTIAL DATA SET

AUTHOR: R. L. Chen

DIRECT TECHNICAL INQUIRIES TO:
R. L. Chen
New York Distribution - IBM Corporation
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New York, N.Y. 10022

*** N - - - - - - - - - ***

DESCRIPTION - This generalized FORTRAN program calculates space requirements for an indexed sequential data set for any standard direct access storage device. These include: 2311, 2314, 2301, 2302, 2303, 2321. Biputs to the program are: device type, record length, block size, key length (if any), number of records, master indices (if desired), and percentage of overflow. The results will be: the total number of cylinders required, tracks required for prime data area and tracks required for cylinder index, master indices and overflow.

PROGRAMMING SYSTEMS - This program can be executed under TOS, DOS or OS where Basic FORTRAN IV is available.

MINIMUM SYSTEM REQUIREMENTS - A 1442 or 2540 Card Reader and a 1403, 1404, or 1443 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D102003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-10.2.004 *M
HIGH WATER MARK (HWM)

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
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P.O. Box 5837 - Mail Stop 423
Orlando, Florida 32805

*** N - HWM 01.4 04.6 - - - - - ***

DESCRIPTION - High Water Mark (HWM) is a modification of MVT so as to produce the maximum amount of core a problem program uses. The HWM value does not reflect the size of the scheduler but only that portion of the region needed to run the job step. Two routines are modified to produce the above results, namely "IEAQGM" (GETMAIN) and "IEFSD263" (Attach). These modifications have been tested utilizing MVT, Release 15/16. GETMAIN was increased by 128 bytes and Attach by 24 bytes. Neither amount should increase system core requirements unless the nucleus and/or the

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link pack area are right at a 2K increment. The HWM value is stored in SQS and is accessible to the accounting routine at step termination.

PROGRAMMING SYSTEMS - Written in OS Assembler Language - F.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run under OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D102004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-10.2.005
CORE AND/OR RESOURCE CONFLICT (CRC) NOTIFICATIONS

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
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Martin Marietta Corporation
P.O. Box 5837, Mail Stop - 423
Orlando, Florida 32805

*** N - CRC 01.4 02.5 - - - - - ***

DESCRIPTION - Under Type I support of MVT, 2 jobs cannot run simultaneously unless (1) all references to identical System Libraries are made with "DISP=SHR" and (2) there is enough core to handle both jobs. If either of these 2 conditions are not met, one of the jobs (the one put into the system last) waits until the other one is finished and has left the system. The operator is not told of this condition and would only know it exists if he uses a "DISPLAY ACTIVE" command. This, of course, places the burden of responsibility on the operator, but much worse, even after identifying the above condition he is incapable of doing anything about it, short of cancelling the job already in execution. Cancelling the job that is in a wait state has no effect since the system has already enqueued on the data set(s) or core and is not capable, at this level, of acting upon the "cancel command". Thus, an initiator and input queue is tied up needlessly, as well as all of the resources (core, disks and tapes) not fully utilized. To circumvent this problem MVT was modified so that if there are any conflicts on data sets and/or core, the operator is informed. At that time he may indicate whether he wishes to wait or cancel. If he decides to "wait", the system will enqueue either on the data set(s) or the core. At this point, of course, cancellation of this job by the operator will have no effect. If the operator, however, decides initially to "cancel" the job will immediately be flushed from the system. Three routines are modified to produce the above results, namely "IEFSD102" (Partition Replace), "IEAQPR" (Get Partition), and "IEFSD166" (Job Deletion). Partition Replace was increased by 702 bytes and GET Partition by 56 bytes. System core requirements might increase by 2K if the link pack area is within 702 bytes of the 2K increment.

PROGRAMMING SYSTEMS - Written in Assembler language level F. These modifications have been tested utilizing MVT, Release 15/16.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for running MVT.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D102005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-10.2.006 *M
NUCLEUS INITIALIZATION PROGRAM (NIP) MODIFICATIONS

AUTHOR: D. Jacobs

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Orlando, Florida 32805

CONTINUED FROM PRIOR COLUMN

*** N - NIP 01.4 05.1 - - - - - ***

DESCRIPTION - Nucleus Intialization Program (NIP) Modification is a modification of OS so as to allow the operator to vary direct access drives offline at IPL time. This, thus, allows an installation running, at least 2 systems, to have duplicate Volume ID's on line and not have to take corrective action when the system discovers this. A "VOFF" parameter has been added to the System Parameters which are specified at IPL time. The specification can be made on a variety of devices - the most common is either the typewriter or the card reader.

PROGRAMMING SYSTEMS - Written in Assembler language level F. These modifications have been tested utilizing MVT, Release 15/16. They should, however, work equally as well with MFT II.

MINIMUM SYSTEM REQUIREMENTS - System core requirements are not affected since NIP code is overlayed after IPL is complete. Minimum core requirements for NIP are the same as that for running MVT and/or MFT II.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D102006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-11.1.001
BURROUGHS B280 SIMULATOR PROGRAM

AUTHOR: Tom Tarrant

DIRECT TECHNICAL INQUIRIES TO:
Linda Tarrant
IBM Corporation
6900 Fannin Street
Houston, Texas 77025

*** N - - 07.0 08.0 12.0 02.0 - - - ***

DESCRIPTION - This program will process, on a System/360, object programs written for a B280 (improved Model 0) three tape system having 4800 memory positions. It simulates I/O functions of one card reader, punch, printer, and three magnetic tape units, overlapping all but tape read operations. S/360 Model 30, 16K, 2540 Reader Punch, 1403 Printer and three 2400 Tape Drives (9 track).

FEATURES - Tape address dialing between jobs is handled through assign cards. Operator communication routines via typewriter, allowing simulation of all B280 console control operations, include Halt, Continue, Memory Display, Alter Memory, instruction branching, Flow Trace, Program Load, and B280 core dump.

PROGRAMMING SYSTEMS - It was written using the 8K Tape Assembler for a Model 30.

MINIMUM SYSTEM REQUIREMENTS - It requires the Commercial Instruction Set, and a console typewriter.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-11.1.002
BURROUGHS B280 SIMULATOR PROGRAM FOR IBM SYSTEM/360

AUTHORS: Tom Tarrant Linda Tarrant

DIRECT TECHNICAL INQUIRIES TO:
Linda Tarrant
IBM Corporation
6900 Fannin
Houston, Texas 77025

*** N - - 07.0 08.0 12.0 02.0 - - - ***

DESCRIPTION - This program will process, on a System/360 object programs written for a B280 4-tape system having either 4800 or 9600 memory positions. It simulates I/O functions of one card reader, punch, printer, and four

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magnetic tape units, overlapping all but tape read operations.

FEATURES - Supervisor routines provide operator communication via typewriter and allow simulation of B280 console operations for Halt, Continue, Memory Display, Alter Memory, instruction branching, Flow Trace, and Program Load. Tape address dialing between jobs is handled through Assign cards. Distinction of Burroughs 4800 position and 9600 position programs is handled through a special control card.

PROGRAMMING SYSTEMS - It was written in Assembly Language for a Model 40.

MINIMUM SYSTEM REQUIREMENTS - It requires 32K memory, Decimal Instruction Set, and a console typewriter.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.003
BURROUGHS B180 SIMULATOR PROGRAM FOR IBM S/360 TO BE USED WITH HARDWARE ASSISTANCE PACKAGE

AUTHOR: Linda Tarrant Tom Tarrant

DIRECT TECHNICAL INQUIRIES TO:
Linda Tarrant
IBM Corporation
5900 Fannin
Houston, Texas 77025

*** N - - 04.0 02.0 - - - - - ***

DESCRIPTION - This program will process, on a System/360, object programs written for a B280 (improved Model 0) four tape system having either 4.8 or 9.6K memory positions. It simulates I/O functions of one card reader, punch, printer, and four magnetic tape units, overlapping all but tape read operations.

FEATURES - Tape address dialing between jobs is handled through assign cards. The memory size of the B180 program is set by a special control card. Operator communication routines via typewriter, allowing simulation of all B180 console control operations, include Halt, Continue, Memory Display, Alter Memory, instruction branching, Flow Trace, Program Load, and B180 core dump.

PROGRAMMING SYSTEMS - It was written using the 8K Tape Assembler for a Model 40.

MINIMUM SYSTEM REQUIREMENTS - It requires 32K memory, the Commercial Instruction set, a console typewriter, and the Hardware Assistance Package

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.008
RCA 501 SIMULATOR PROGRAM FOR THE IBM SYSTEM/360

AUTHOR: W. G. Kelly J. J. Cohen
G. F. Deruyter M. V. Morreale
Lynn G. Basch

DIRECT TECHNICAL INQUIRIES TO:
W. G. Kelly
IBM Corporation
ERO Commercial Analysis
425 Park Avenue
New York, New York

*** N - - - - - - - - - ***

DESCRIPTION - This program will process on a System/360 object programs written for an RCA 501. The Simulator

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contains all the routines required to simulate 501 instructions and reserves an area of System/360 main storage to simulate the 501 high speed memory.

FEATURES - By means of OS/360 data definition cards, System/360 I/O devices are assigned to perfcrm the corresponding functions of the 501 I/O devices. The SIM 501 program package contains the Simulation Monitor and the 501 Interpreter programs.

PROGRAMMING SYSTEMS - The source language is Basic Assembler.

MINIMUM SYSTEM REQUIREMENTS - The program will require 100,000 bytes of memory plus storage room for the RCA program.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.009
RCA 301 SIMULATOR FOR S/360

AUTHOR: G. Drake

DIRECT TECHNICAL INQUIRIES TO:
G. Drake
IBM Corporation
3424 Wilshire Boulevard
Los Angeles, California

*** N - - - - - - - - - ***

DESCRIPTION - A program to operate under DOS to simulate most features of the RCA 301 system. 301 punch, race file, paper tape reader, tape drives, disk file and monitor printer will be simulated on the appropriate System/360 devices. RCA 301 tape files and paper tape must be file converted before use by the simulator.

PROGRAMMING SYSTEMS - The Simulator is coded in DOS Assembly Language, optimized for the System/360 Mod 40, and uses DOS LIOCS and PIOCS macros to simulate I/O.

MINIMUM SYSTEM REQUIREMENTS - A 64K System/360 is required for 10K and 20K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.011
IBM SYSTEM/360 PROGRAM TO SIMULATE THE GE 225

AUTHOR: W. M. Hallinan

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
618 So. Michigan Avenue
Chicago, Illinois 60605

*** N - - 11.2 11.3 - - - - - ***

DESCRIPTION - This program simulates the GE 225 on a System/360. The program will process GE 225 object programs for configurations using 4K, 8K or 16K words of memory; up to sixteen tapes, up to two printers, a card reader, a card punch, and a console typewriter. The 360 program will also simulate the following optional features available on the GE 225 CPU-Decimal Package, MOVE command, and the Automatic Program Interrupt.

FEATURES - A program to convert GE-225 magnetic tape to the proper format is included.

PROGRAMMING SYSTEMS - The simulator program is written in 360 Assembler Language to run under the Disk Operating System (DOS).

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MINIMUM SYSTEM REQUIREMENTS - The System/360 must have at least 64K of memory, Decimal Arithmetic, a console typewriter, and a Systems Residence File. In addition the program requires one equivalent 360 I/O device for each GE 225 I/O Device to be simulated. Simulation of the Automatic Program Interrupt feature requires the Interval Timer feature on the System 360 and simulation of a 16K GE requires a 360 with 128K bytes of memory. The Column Binary (2821), or Card Image (2501) feature is required to simulate card I/O.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.012
SYSTEM/360 PROGRAMS TO CONVERT RCA 382 TAPES FOR INPUT TO RCA 301 SIMULATOR/EMULATOR AND SYSTEM/360 PROGRAMS

AUTHOR: G. Smith G. Drake

DIRECT TECHNICAL INQUIRIES TO:
G. Smith
IBM Corporation
3424 Wilshire Boulevard
Los Angeles, California 90005

*** N - - 00.3 06.5 12.1 11.2 - - - ***

DESCRIPTION - Two RCA 382 to System/360 tape conversion programs. A System/360 program to convert RCA 382 tapes for input to RCA 301 Simulator/Emulator. The Simulator is a Type III program - 360D-11.1.009. A System/360 program to convert RCA 382 tapes for input to System/360 programs.

PROGRAMMING SYSTEMS - Both programs are stand-alone Assembler programs.

MINIMUM SYSTEM REQUIREMENTS - They require 64K and three tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.1.013 *M
NABAC PROOF AND TRANSIT SIMULATION MODEL

AUTHOR: Director of Research

DIRECT TECHNICAL INQUIRIES TO:
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NABAC
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Park Ridge, Illinois 60068

*** N - - 11.2 15.1 20.3 - - - - ***

DESCRIPTION - The NABAC Proof and Transit Simulation Model is a mathematical aid to help bank management evaluate its present check handling methods and compare its system with alternative systems.

FEATURES - The printout from the program will show the percentage of personnel utilization in the department, the number of items meeting deadlines, and the backlog of items unprocessed for various periods.

PROGRAMMING SYSTEMS - The program was compiled using BPS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - It needs at least a 32K System 360, a card reader, a printer, a console typewriter and at least 4 tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

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ORDERING INFORMATION: PROGRAM NUMBER 360D111013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.015
RCA 381 TO SYSTEM/360 TAPE CONVERSION PROGRAMS

AUTHORS: G. Smith G. Drake

DIRECT TECHNICAL INQUIRIES TO:
G. Smith
IBM Corporation
3424 Wilshire Blvd.
Los Angeles, Calif. 90005

*** N - - 00.3 03.6 06.5 12.1 - - - ***

DECRIPTION - Two RCA 381 to System/360 tape conversion programs for system/360 which use as input the output of included 1401 program that reformats RCA 381 tapes. The three programs included in this package-

- A 1401 program to read RCA 381 tapes with mixed parity and copy on IBM 729 Tape Drives with standard IRG and parity. This reformatted output is used as input to the following two programs.
- A System/360 program to convert RCA 381 coded tapes for input to RCA 301 Simulator/Emulator (360D-11.1.009).
- A System/360 program to convert RCA 381 coded data tapes for input to System/360 programs.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - 1401 program- Advanced Programming, indexing, 2 tape drives, 1 card reader. 360 programs- 64K, 3 tape drives (one must be 7-track), 1 card reader.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.1.016
IBM SYSTEM/360 PROGRAM TO EMULATE THE RCA 301

AUTHOR: G. Drake

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*** N - - - - - - - - - ***

DESCRIPTION - A program to operate DOS to emulate most features of the RCA 301. The Emulator Program operates with RCA 301 Emulator RPG NO. E50441, which is installed on a Model 40 System/360.

PROGRAMMING SYSTEMS - Runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - A 64K Model 40 is required and will emulate 303-304-305 RCA 301 CPU's.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.017
1401 SIMULATOR FOR S/360

AUTHOR: W. G. Wilcox

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DIRECT TECHNICAL INQUIRIES TO:
W. G. Wilcox
IBM Corporation
c/o American Airlines Bldg.
Albany Post Rd.
Briarcliff Manor, N.Y. 10510

*** N - - - - - - - - - ***

DESCRIPTION - This program allows the execution of 1401 programs on a System/360 Model 30, 40, 50, 65 or 75 without using any special hardware or re-programming. 1401 features that are supported are- Advanced Programming, sense switches, tapes, 16K core, Multiply, Divide, and all standard instructions except Select Stacker. Operator control is through the 1052 and tape and includes sense switch assignment, load from cards or tape, display and alter core, Start Reset, Start, clear core, set and clear I/O check switch, and write tape mark.

PROGRAMMING SYSTEMS - The program is written in OS/360 Assembler Language. NOTE - The program can run as a stand-alone.

MINIMUM SYSTEM REQUIREMENTS - S/360 65K with Standard Instruction Set, a 1052, 1403, and 2540.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.018
CIDS - A 1401 SIMULATOR PROGRAM FOR SYSTEM/360

AUTHOR: D. V. Thomas

DIRECT TECHNICAL INQUIRIES TO:
D. V. Thomas
IBM Corporation
373 Broadway Ave.
Winnipeg 1, Manitoba, Canada

*** N - - - - - - - - - ***

DESCRIPTION - This program allows the execution of any 1401 program on a System/360 without requiring any special hardware. The program is supplied as an Assembler Language macro and can be generated to simulate a 0 - 6 tape 1401 with up to 16K of core storage. CIDS will support the 1401 sense switch, Hi-Lo-Eq Compare, Expanded Print Edit, Modify Address, Multiply-divide, Process Overlap and Advanced Programming special features as well as all standard instructions. Operator functions are simulated through the use of the console typewriter. A special control card allows job stacking in the normal DOS/TOS job stream, an instruction trace feature, an automatic core dump routine, sense switch pre-setting and end-of-job recognition for stacked job operation are included to improve operational efficiency. A modular structure and exits are provided to allow the addition of routines to support other I/O devices and special features. Device independent routines are included and allow simulation of reader, printer and punch functions on tape.

PROGRAMMING SYSTEMS - Written in Assembler Language and operates under DOS/TOS.

MINIMUM SYSTEM REQUIREMENTS - An 8K card 1401 can be simulated on a 32K System/360 which also meets the requirements of DOS/TOS. A 64K System/360 is required for all other 1401 configurations.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.019 *M
1401 SIMULATOR FOR OS/360

AUTHORS: W. G. Wilcox D. A. Hutt

CONTINUED FROM PRIOR COLUMN

DIRECT TECHNICAL INQUIRIES TO:
W. G. Wilcox
American Airlines Bldg.
Albany Post Rd.
Briarcliff Manor, N.Y. 10510

*** N - - - - - - - - - ***

DESCRIPTION - This program allows the execution of 1401 programs on a System/360 Model 30-75, under control of the operating system, PCP, MFT, or MVT. No special hardware is required. 1401 features supported are Advanced Programming, sense switches, tapes, Multiply, Divide, 16K core, and all standard instructions except Select Stacker. Operator control is through the 1052 and includes tape and sense switch assignment, load from cards or tape, display and alter core, Start Reset, Start, Clear Core, Write Tape Mark, and Rewind.

PROGRAMMING SYSTEMS - Written in OS/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The same as for OS/360 and must include I/O devices used for simulation. If tape simulation is desired, tape drives must also be available. The Simulator program requires approximately 70,000 bytes of core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.020
MODEL 20 RPG SIMULATOR

AUTHOR: A. J. Kostler

DIRECT TECHNICAL INQUIRIES TO:
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Republic Steel Corp.
1546 Guildhall Bldg.
P.O. Box 6778
Cleveland, Ohio 44101

*** G CDR - 05.1 - - - - - - ***

DESCRIPTION - This simulator is a stand alone program that, without program changes or control cards, enables object programs that have been operating on a card Model 20 to be executed on a larger model System/360. The simulator provides Model 20 back-up facilities at machine language level and eliminates the need to alter, re-arrange, and recompile a Model 20 RPG source program when upward compatibility back-up is required.

PROGRAMMING SYSTEMS - The program is written in RPG language.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 24K bytes of main storage and simulates a Model 20 with a 2501 Card Reader, 2520 Card Punch, and 1403 Printer on a larger Model S/360 with a 2540 Card Read/Punch and 1403 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.1.021
BURROUGHS 280/283 SIMULATOR

AUTHOR: A. V. Rieder

DIRECT TECHNICAL INQUIRIES TO:
A. V. Rieder
IBM Corporation
540 E. Main St.
Rochester, N.Y. 14604

*** N - - - - - - - - - ***

DESCRIPTION - This program simulates on the 360/30 or 40 a B280-283 system with a 9.6K memory and the Standard Instruction Set. It will support up to 3 magnetic tapes

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and the read and write binary tape special feature.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language, and the operating system required is DOS/360.

MINIMUM SYSTEM REQUIREMENTS - 32K Model 30 with Decimal Arithmetic, one disk drive and as many tapes as are to be simulated.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.1.022
THE 1401-1311 SIMULATOR UNDER OS/360

AUTHOR: J. M. O'Brien, Jr.

DIRECT TECHNICAL INQUIRIES TO:
J. M. O'Brien, Jr.
IBM Corporation
413 W. State Street
Trenton, N. J.

*** N - - - - - - - - - - ***

DESCRIPTION - This program simulates the 1401 with 1311 Disk Drives. The Simulator supports all standard features (except Stacker Select) plus the following special features: Advanced Programming, Sense Switches, Move Record, tape, Multiply/Divide, Expanded Print Edit, 1311 disk storage (except "track-record" and "file-scan").

PROGRAMMING SYSTEMS - The program is written in O/S Assembler Language and uses "QSAM" and "EDAM" under OS/360.

MINIMUM SYSTEM REQUIREMENTS - In addition to those of OS/360; sufficient 2311 (2314) disk area to simulate 1311 storage. (Note: 3 simulated 1311's fit on one 2311).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.1.023
DISK RESIDENCE FOR 1410 COMPATIBILITY MODE PROGRAMS ON THE IBM S/360 MODEL 40

AUTHORS: Johanne C. Pryor J. S. Margerison

DIRECT TECHNICAL INQUIRIES TO:
Elizabeth W. Auman
P.O. Box 21607
Greensboro, North Carolina 27420

*** N - - - - - - - - - ***

DESCRIPTION - This program unit gives the user ability to catalog 1410 programs in core image form on a 1316 Disk Pack and to recover the programs at execution time. The program also provides the ability to update the 1410 core image file. Use of this program results in considerable time savings to the customer.

PROGRAMMING SYSTEMS - Written in Assembler language using physical IOCS.

MINIMUM SYSTEM REQUIREMENTS - I/O Card Read Punch (2540), 2 - 2311 Disk Drives, 1403 Printer, console typewriter on a 128K Model 40 (modifications have been made to original programs to allow this programming system to operate in a 65K environment) with Compatibility (1410).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111023

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.1.025 *M
COMPATIBILITY OPERATING SYSTEM FOR EMULATION OF 1410/7010 PROGRAMS UNDER OS/360 ON A S/360 MODEL 50 (COS 50)

AUTHOR: A.J. Albert J.E. Marsala
C. H. Houser D. M. Gerth
M. P. Gallagher M. M. Rivers

DIRECT TECHNICAL INQUIRIES TO:
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Arlington, Va. 22203

R. E. Marsala
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A. J. Albert
IBM Corporation
643 W. Crosstown Pkwy.
Kalamazoo, Mich. 49001

C. H. Houser
IBM Corporation
4040 N. Fairfax Dr.
Arlington, Va. 22203

*** N - - 11.2 11.3 11.4 - - - - ***

DESCRIPTION - COS 50 is a program designed to allow the user to run both S/360 programs and 1410/7010 programs in a single job stream on a S/360 Model 50. Essentially COS 50 is a modification of the 1410/7010 Emulator Program allowing it to operate in a multiprogramming mode under the control of Operating System/360 (OS) (MFT II and MVT). COS 50 offers the following: (1) Increased throughput through the use of multiprogramming. (2) 100% Stacked Job processing. 1410/7010 and S/360 programs can be intermixed in the job stream without operator intervention. (3) Capability of running two or more 1410/7010 programs simultaneously. (4) COS 50 can be tailored to any 1410/7010 configuration. (5) No modifications are necessary for 1410/7010 programs. (6) Support of 1301 and 2302 Disk Drives on the 2314. (7) Support of 7 track tape data on 7 and 9 track tape drives (200-800 bpi). (8) Unit Record I/O is accomplished via QSAM (Queued Sequential Access Method). (9) Tape and disk I/O is accomplished through EXCP (Execute Channel Program) and OS provided appendages. (10) COS 50 data sets and the Stand Alone Emulator files can be made compatible so that COS 50 and the Emulator will be interchangeable. (11) Unit record devices can be simulated through OS readers and writers.

PROGRAMMING SYSTEMS - COS is a modification of the 1410/7010 Emulator Program allowing it to operate in a multiprogramming mode under the control of Operating System/360 (MFT II and MVT).

MINIMUM SYSTEM REQUIREMENTS -

1. Processor - S/360 Model 50G, 128K - The actual amount of storage required will depend upon the requirements of the user. That is, the features of OS that are utilized and the size of the 1410/7010 system being emulated.

2. I/O Devices - Whatever systems configuration is required to operate the users OS/360 plus those tape and disk devices required by the 1410/7010 Operating System.

 a. Tape - One (1) S/360 tape drive for each 1410/7010 tape drive.

 b. Disk (2314 Direct Access Storage Device) - Every access (every arm) of the 1301 or 2302 requires one (1) S/360 data set containing 10,000 2314 tracks.

3. The Emulator feature for the Model 50, that is, 1410/7010 Compatability #4478.

4. Compatibility Operating System RPG #F23666.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Assembler Language Macros.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111025

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-11.1.026
B-300 SIMULATOR PROGRAM FOR IBM SYSTEM/360 MODEL 40 WITH HARDWARE - ASSIST PACKAGE RUN UNDER DOS.

AUTHOR: T. H. Haworth

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DIRECT TECHNICAL INQUIRIES TO:
T. H. Haworth
IBM Corporation
611 E. Wisconsin Avenue
Milwaukee, Wisconsin 53202

*** N - - - - - - - - - - ***

DESCRIPTION - This program will process, on a System/360, object programs written for a B-300 four tape system having either 4.8 or 9.6K memory positions. This program is a modification of the Type III program "B280 Simulator Program - Version 3". This program has the same requirements and functions of the original with these additions: (1) It will simulate B-300 programs in addition to the others (not including 19.2K programs); (2) The program runs under DOS; (3) Utilizing DOS Multiprogramming facilities, it is possible to run more than one simulator at the same time. All other facilities remain intact.

PROGRAMMING SYSTEMS - Written using PIOCS, BAL and DOS.

MINIMUM SYSTEM REQUIREMENTS - 32K memory, the Commercial Instruction Set, a console typewriter and the hardware assistance package.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D111026

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.2.001
DIRECT ACCESS METHOD FOR COMPATIBILITY (DAMCOM)

AUTHORS: D. W. Wright D. H. Anderson

DIRECT TECHNICAL INQUIRIES TO:
D. W. Wright
IBM Corporation
Garden State Parkway, Exit 136
Cranford, N.J. 07016

*** N - - 01.7 03.8 10.3 - - - - ***

DESCRIPTION - This routine was developed for a specific need, which was to enable an orderly conversion from 1400 to System/360. By using this routine, both 1400 and System/360 programs can access the same files, thereby allowing conversion to proceed at a more reasonable rate than would be allowed if all programs affecting a file had to be converted at once. This routine is designed to allow System/360 DOS programs to use 2311 disk files formatted for compatibility (hardware and/or COS) with 1400/1311 programs. This routine is link edited with the calling program and performs all I/O functions needed to support the simulated compatibility operation. in addition, if simultaneous conversion is not possible, use of this routine would alleviate any need for keeping duplicate files., i.e., one copy in compatibility format and one copy in native System/360 Format.

PROGRAMMING SYSTEMS - ALP and DOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D112001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.2.002
DOS/MICR SIMULATOR

AUTHOR: W. V. Toner

DIRECT TECHNICAL INQUIRIES TO:
W. V. Toner
IBM Corporation
Seven Penn Center Plaza
Philadelphia, Pa. 19103

*** N - - - - - - - - - ***

DESCRIPTION - This program is a package of macro definitions

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and a relocatable module which will simulate for the users program as many as three MICR reader/sorters. Functions normally performed by the DTFMR, DTFMR I/O macros, and DTFMR logic module are assumed by the simulator. Instead the user incorporates into his program the simulators I/O module and special macros which are functionally identical as those provided by the DOS system. Consequently, when the user no longer needs simulation services, his MICR program can be reassembled with the standard macros for software support. Simulated MICR input to the program is from a card reader and/or as many as two magnetic tape units.

PROGRAMMING SYSTEMS - The simulator and its macro definition are coded in DOS/360 Assembler Language and runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS- The same as those for the DOS system to be simulated with the exception that a card reader or tape unit replaces each 1419 to be simulated. It is not required that the users DOS supervisor have the MICR option.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D112002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.2.003 *M
SIMULATOR FOR UNIVAC, I, II, AND EXTENDED ON SYSTEM/360

AUTHOR: E. H. Behrendt

DIRECT TECHNICAL INQUIRIES TO:
E. H. Behrendt
IBM Corporation
3700 Wilshire Blvd., Suite 700
Los Angeles, California 90005

*** N - - - - - - - - - ***

DESCRIPTION - This UNIVAC simulator handles all normal functions of a twelve tape system. Included are routines for handling breakpoints, adder-alpha conditions, arithmetic overflow, type out and store selector functions, SERVO settings, circle memory, and error conditions. Data files are on tape; programs may be entered from cards or tape. The simulator remains core resident between UNIVAC runs. Simulated SERVOS allow random read forward and backward commands, as well as write instructions. All tape input is unlabelled, double buffered, and is written in character format at 720 characters per record blocked five.

PROGRAMMING SYSTEMS - Programming language - Assembler Language. Operating system required - DOS/360.

MINIMUM SYSTEM REQUIREMENTS - 156K of memory. Internal processing speed, exclusive of any input/output, is estimated on a Model 50 at 1.5 faster than the UNIVAC II. Under DOS the program will require one work pack for assembling and link-editing. Once catalogued, only the systems pack is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D112003

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-11.2.004
IBM 2938 ARRAY PROCESSOR SIMULATOR FOR OS/360 AND FOR 44PS

AUTHOR: M. N. Cree

DIRECT TECHNICAL INQUIRIES TO:
M. N. Cree
IBM Corporation
Scientific & Ind. Dev. Center
6900 Fannin Street
Houston, Texas 77025

*** N - - 45.0 - - - - - - ***

DESCRIPTION - This IBM System/360 FORTRAN-Callable subroutine closely simulates the operation of the IBM 2938 Array Processor Model 1 or Model 2 for integer or prenormalized floating point data, It processes pre-built channel programs and posts a Channel Status Word and a return code back into areas designated by the user. Provision is made for Programmed Controlled Interrupt.

PROGRAMMING SYSTEMS - Language - S/360 Assembly Language but uses no macros. Through conditional assembly, it can

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be made to use only instructions available on the S/360 Model 44. Modules to interface between the Simulator and APAM/44 or APAM/360 are included in the distribution. Program requires OS/360 or 44PS.

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360 or 44PS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D112004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-11.3.006
1401/1460 SENSE SWITCH PROGRAM FOR S/360 COMPATIBILITY MODE

AUTHOR: J. Black

DIRECT TECHNICAL INQUIRIES TO:
J. Black
University of Missouri at Columbia
DP Services
401 East Stewart Rd.
Columbia, Mo. 65201

*** N - - 03.4 03.6 - - - - - ***

DESCRIPTION - The Sense Switch Program is designed to run in 1401/1460 Compatibility Mode on a S/360 and print sense switch settings on a 1403 Printer. The intent of the program is only to document sense switch settings before program load time and to facilitate operator changes by giving printed evidence of microprogrammed console manipulations.

PROGRAMMING SYSTEMS - Written in 1401 Autocoder.

MINIMUM SYSTEM REQUIREMENTS - S/360 which has the 1401/1460 Basic Compatibility Feature, card reader, and 1403 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D113006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.3.009
EMULATION OF 1405 DISK STORAGE UNDER THE 1401 EMULATOR

AUTHOR: W. A. Marsh

DIRECT TECHNICAL INQUIRIES TO:
W. A. Marsh
IBM Corp.
1130 So. Sixth St.
Springfield, Ill.

*** N - - 00.4 12.0 - - - - - ***

DESCRIPTION - This is a modification to Version III of the 1401 Emulator 360C-EU-074. It will support sector and track 1405 operations in MOVE mode only. 1311 operations cannot be performed when this modification is being used.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Identical to those for the basic emulator which supports 1311 compatibility, and one 2311 drive for each 25,87# 1405 sector.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D113009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.3.010 *M
1419 SIMULATOR FOR PROGRAMS WRITTEN UNDER 1419/360 INPUT OUTPUT CONTROL PROGRAM

AUTHOR: Miss J. M. Blair

DIRECT TECHNICAL INQUIRIES TO:
Miss J. M. Blair
IBM Corp.
Seven Penn Center
Philadelphia, Pa. 19103

*** N - - 06.1 12.0 04.3 - - - - ***

DESCRIPTION - The 1419/360 Simulator is a subroutine written as a preinstallation aid in order to allow the testing of reader-sorter programs when a 1419 is not available on the 360 system. The simulator is assembled with the problem program and through card input simulates the reading of MICR documents under IOCP (360P-IO-058).

PROGRAMMING SYSTEMS - Written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 and a card reader.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D113010

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-11.3.013
EMULATION OF 1410-7010 1301 ON 360/40 2314

AUTHORS: J. T. Sox R. W. Zolkiewicz

DIRECT TECHNICAL INQUIRIES TO:
J. T. Sox
IBM Corp.
200 E. Camperdown Way
Greenville, S. C. 29601

*** N - - 03.4 11.1 11.2 - - - - ***

DESCRIPTION - The 1410-7010 Emulator (360A-EU-728) program has been modified to use a 2314 instead of a 2302 for emulation of a 1301. Improved performance is gained by use of a 2314.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Same for using a 2302. Three 2314 drives are required for each 1301 module.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D113013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.3.014 *M
1011 PAPER TAPE READER SUBROUTINE FOR COS UNDER DOS.

AUTHOR: G. R. Hydak

DIRECT TECHNICAL INQUIRIES TO:
G. R. Hydak
c/o Thatcher Glass Mfg. Co.
Elmira, N. Y. 14902

*** N - - - - - - - - - ***

DESCRIPTION - Numerous scan and translate tables (and end of record characters) may be catalogued into the Core Image Library and the appropriate one is loaded into COS core at load time of a 1401 program. This is accomplished by a unique one position parameter I in the // 1400 card. This modification was designed for undefined length records and 1401 programs utilizing a variety of scan and translate tables, and end of record characters. The end of record character is also placed into 1400 core for problem program processing.

PROGRAMMING SYSTEMS - These S/360 Assembler Language routines have been designed for insertion into COS Version 5 Compatibility Operating System to support simulation of the 1011 Paper Tape Reader. The program was compiled and tested under DOS system Release 17.

MINIMUM SYSTEM REQUIREMENTS - The S/360 machine configuration necessary is the same as is currently required by the individual user's COS generation, with the exception of core storage. The paper tape routines require 1300

CONTINUED FROM PRIOR PAGE

positions of core, and the paper tape input area (in COS core) requires 9001 positions of core. The paper tape input area (in COS core) may be reduced, however, to the user's requirements. The size of this should be one position larger than the largest paper tape input area in any 1401 programs that are to utilize this feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D0113014

Indicate "E N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-11.4.001 *M
A SIMULATOR PROGRAM IMPLEMENTING THE NOBIS EDUCATIONAL COMPUTER DESIGN

AUTHORS: R. Lord G. Barratt

DIRECT TECHNICAL INQUIRIES TO:
G. Barratt
Customer Education
IBM Australia Limited
Box 88, P. O., St. Kilda
Melbourne, Victoria, Australia

*** N - - 30.1 12.1 - - - - - ***

DESCRIPTION - The program is intended as support for an Education Centre course and acts as the medium through which students can gain practical programming experience using a simple instruction set and programming at the machine level. The program simulates the "NOBIS" (Numerically Oriented Basic Instruction System) computer. The monitor occupies 4640 positions of core storage from location 7648. Core locations 12K to 16K are reserved as the core area for the NOBIS program.

PROGRAMMING SYSTEMS - Written in Assembler Language under 8K BOS.

MINIMUM SYSTEM REQUIREMENTS - System/360 with 16K, one 2540, and one 1403.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D114001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.4.002
DCALC

AUTHOR: R. F. Rosin

DIRECT TECHNICAL INQUIRIES TO:
R. F. Rosin
Yale Computer Center
175 Whitney Ave.
New Haven, Conn. 06520

*** S YU DCAL 03.3 30.2 - - - - - ***

DESCRIPTION - The purpose of DCALC is to provide an interactive desk-calculator facility under OS in an environment supporting 2741's and other interactive devices. The character strings in lines 80-138 of the listing describe its use, and show how it is much more than a simple desk-calculator. DCALC uses SYSIN and SYSPRINT for all I/O.

PROGRAMMING SYSTEMS - Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - Those required to run S/360 OS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D114002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-11.4.003 *N
THE 141 MONITOR - AN EDUCATIONAL COMPUTER FOR BASIC COMPUTER INSTRUCTION

AUTHOR: W.T. Price

DIRECT TECHNICAL INQUIRIES TO:
W.T. Price
5714 Grove St.
Oakland, California 94609

*** N - - 03.1 05.1 11.1 - - - - ***

DESCRIPTION - The 141 MONITOR program is an instructional device designed to facilitate the teaching of basic stored program principles using the 141 Data Processing System, an abbreviated version of the IBM 1401. Programs written in IBM 1401 (141 subset) machine language or the Symbolic Programming System can be handled by the MONITOR on a S/360. A typical SPS job will involve assembly of the SPS program, loading the resulting machine language program into simulated 141 storage and executing the program. All 141 instructions are simulated by MONITOR. A sucessful run will yield (1) source program listing, (2) post-assembly listing, (3) program output and (4) a 141 storage dump. All error conditions are detected by MONITOR and appropriate error messages included. An interval timer routine is included to terminate student programs with infinite loops.

PROGRAMMING SYSTEMS - The MONITOR program is written in DOS/TOS Assembly Language and has been assembled and tested on a S/360 Model 25 and Model 40.

MINIMUM SYSTEM REQUIREMENTS - 11K of storage required, line printer with 120 print positions, a card reader, optionally a card punch, and one disk or tape drive. Four tracks on a 2311 are sufficient for handling intermediate results during the 141 assembly operation.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D114003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	000	none
OPTIONAL	none	none		none

360D-12.0.002
FAMILIARIZATION PROGRAM FOR THE MODEL 40 1401/1460 EMULATOR

AUTHOR: R. A. MacKinnon

DIRECT TECHNICAL INQUIRIES TO:
R. A. MacKinnon
IBM Corp.
112 East Post Road
White Plains, New York 10601

*** N - - 30.2 11.0 - - - - - ***

DESCRIPTION - The program presents a controlled environment within which concole operators, who will run the Model 40 in Compatibility Mode, can communicate with the 1401/1460 Emulator Program. Used in conjunction with a formal presentation of emulator concepts, control statements, and commands, the familiarization program can test and strengthen each operators level of knowledge on an individual and personal basis. Specifically, the exercise presents the operator with the two types of 1401 halts, requires branching and turning on and off of a sense switch, asks the user to enter a Julian date in LOAD Mode, and asks the user to initialize the exercise either by branching to a specified location or through an emulator facility for loading an object deck from the card reader. Wherever possible, the operators actions are verified and appropriate notification of correct or incorrect procedure is given on the 1052. BPS program 360-EU-074 must first be loaded to accomplish emulation of the familiarization program.

PROGRAMMING SYSTEMS - Written in 1401 Tape Autocoder.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 40 with 1401/1460 Compatibility feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D120002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.0.003
SIFT BCD CODES TO EBC AND DIAGNOSE FORTRAN IV CONVERSION PROBLEMS UNDER OS/360

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
D. Jacobs
The Boeing Co.
Vertol Div.
100 Woodland Ave.
Plant 3-01, Mail Stop P30-47
Ridley Park, Pa.

*** S VDB SFTO 00.0 04.3 06.5 12.1 - - - ***

DESCRIPTION - This program sifts BCD codes into EBC as well as diagnosing certain conversion problems which a FORTRAN IV program will have upon converting to the 360. The problems which are diagnosed are -

- All format statements containing "A5 formats", or greater flagged with an "A". All format statements containing "O formats" are flagged with an "O". At the end of each routine (end indicated by an "END Card") a reference table is produced indicating the location of every Format statement (by ISN) and the location of their respective read/write statements (by ISN).
- Every binary read/write statement is flagged with a "B".
- Every call to a subroutine which is not in the subroutine library is flagged with a "C". The standard subroutine list is compiled by the user and put in a sequential data set. A reference table of called subroutines and whether or not they are flagged is produced after the Format/read/write reference table.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D120003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.0.004
SIFT BCD CODES TO EBC AND DIAGNOSE FORTRAN IV CONVERSION PROBLEMS UNDER BOS/360

AUTHOR: D. Jacobs

DIRECT TECHNICAL INQUIRIES TO:
D. Jacobs
The Boeing Co.
Vertol Division
Plant 3-01, Mail Stop P30-47
100 Woodland Ave.
Ridley Park, Pa.

*** S VDB SFTB 00.3 04.3 06.5 12.1 - - - ***

DESCRIPTION - This program sifts BCD codes into EBC as well as diagnosing certain conversion problems which a FORTRAN IV program will have upon converting to the 360. The problems which are diagnosed are -

- All format statements containing "A5 formats", or greater flagged with an "A". All format statements containing "O formats" are flagged with an "O". At the end of each routine (by end indicated by an "END card") a reference table is produced indicating the location of every format statement (by ISN) and the location of their respective read-write statements (by ISN).
- Every binary read-write statement is flagged with a "B".
- Every call to a subroutine which is not in the subroutine library is flagged with a "C". The standard subroutine list is compiled by the user and put in a sequential data set. A reference table of called subroutines and whether or not they are flagged is produced after the format-read-write reference table.

The subroutine table is read in write after the END card of the object module. Each name should appear on a card beginning in column 1. The last name should be "9END". Cards are read in via SYSIPT. Listings are produced via SYSLST. Punched output is produced via SYSOPT.

PROGRAMMING SYSTEMS - Runs under BOS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for BOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

CONTINUED FROM PRIOR COLUMN

ORDERING INFORMATION: PROGRAM NUMBER 360D120004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.0.005 *M
LABELS - A CONVERSION AID SUBROUTINE TO PROCESS 1400 SERIES AND 7010 80 CHARACTER LABELS IN CONJUNCTION WITH DOS/TOS PROGRAMS IN BAL, COBOL, OR RPG

AUTHOR: R. McClellan, Jr.

DIRECT TECHNICAL INQUIRIES TO:
R. McClellan, Jr.
IBM Corporation
400 Wyman Street
Waltham, Mass. 02154

*** N - - - - - - - - - - ***

DESCRIPTION - The LABELS subroutine enables a DOS or TOS program written in BAL, COBOL or RPG to process 1400 series (1401, 1410, 1440 and 1460) and 7010 standard 80 character labels and check any or all of the following - file ID, serial number, reel sequence, retention and/or block count. The labels subroutine offers the following benefits -

- All three source languages are handled by the labels subroutine.
- Operator procedures are uniform.
- Checking options can be altered by control card rather than through recompilation.
- Main program coding is limited to one line per file with non-standard labels.
- Six months of field testing have uncovered no defects.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - System/360, 3.7K, 1052 Printer-Keyboard, 7 or 9 track tape drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D120005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.0.006
DOS II TO DOS III CONTROL CARD CONVERTER

AUTHOR: P. T. King

DIRECT TECHNICAL INQUIRIES TO:
P. T. King
IBM Corporation
2145 Highland Avenue
Birmingham, Alabama 35205

*** N - - 06.5 - - - - - - ***

DESCRIPTION - This program is designed to aid DOS Version II users in converting to DOS III. Input is accepted in the form of job control cards in DOS format. The output is a listing and a deck of control cards for DOS III. All control cards for all forms of 2311 files supported by DOS logical IOCS will be converted. This includes split cylinder support.

PROGRAMMING SYSTEMS - Programming language - Basic Assembler and Logical IOCS. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30, 16K, 2540, 1-2311, 1403, and 1052.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D120006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.6.009
SYSTEM/360 ENGLISH TO GRADE 2 BRAILLE TRANSLATOR

AUTHORS: Annette Morgan
Connie Pelzer

DIRECT TECHNICAL INQUIRIES TO:
Alan Scher
IBM Corporation
1371 Peachtree St., N.E.
Suite 200
Atlanta, Georgia

*** N - - - - - - - - - - - ***

DESCRIPTION - The purpose of this program is to lessen the lapse of time between the request for and the translation of English special texts and written material into Braille. Program features include centered headings, page numbering, paragraphing, foreign language translation as well as numeral and Roman numeral translation.

PROGRAMMING SYSTEMS - The program is written in Assembler language using OS/360 and translates English into Grade 2 Braille whenever possible; otherwise, Grade 1 Braille is used.

MINIMUM SYSTEM REQUIREMENTS - Two 2400 Tape Drives, one 2311 for a dictionary, 12K Machine, one 1403 Printer (Model 3 or N1) with the RPQ Braille feature, and BDAM access method are the requirements. (Disk may be substituted for the tapes, and a 2314 may be used in lieu of 2311s.)

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D120009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-12.1.010
BOS SOURCE DECK CONVERSION TO DOS

AUTHOR: D. L. Coble

DIRECT TECHNICAL INQUIRIES TO:
D. L. Coble
IBM Corporation
100 W. Kennedy Blvd.
Tampa, Fla. 33602

*** N - CONV - - - - - - - ***

DESCRIPTION - The "BOS Source Deck Conversion to DOS" is a program to convert S/360 BOS coded macros and DTF statements into DOS format. The primary function is to convert the general BOS DTFSR descriptions to specific DOS file descriptions. For example, the DTFSR for the printer is changed to DTFPR format. Also, the necessary changes to the DTFDA, DTFIS, DTFPH and BCS macros are included.

PROGRAMMING SYSTEMS - The program is source deck to source deck conversion written in S/360 BAL for use with BOS or DOS.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30, 16K, card reader (any model), printer (any model), and card punch, tape drive, or disk drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D121010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-12.1.011 *M
CS FORTRAN IV SUBROUTINES FOR READING AND CONVERTING BINARY TAPES GENERATED BY A 7094

AUTHORS: G. M. Knaup D. J. Martin

DIRECT TECHNICAL INQUIRIES TO:
G. M. Knaup

CONTINUED FROM PRIOR COLUMN

IBM Corporation
1120 Connecticut Ave., N.W.
Washington, D. C. 20036

*** N - - 07.1 - - - - - - ***

DESCRIPTION - This package, written in S/360 OS Assembly Language, consists of two sets of subroutines. The first set facilitates the reading of a 7-track binary tape generated by an IBM 7094 computer into a S/360 program. Subroutines are provided to read and deblock tapes with the following formats -

- DCS - FORTRAN IV.
- DCS - Non-FORTRAN IV.
- 7094 Non-DCS-FORTRAN IV.
- Any 7-track tape.

The second set facilitates the conversion of 7094 generated data, read by the first subroutine set, from a 36-bit word size to a 32-bit word size.

PROGRAMMING SYSTEMS - This package is written in System/360 Assembler Language and employs facilities of OS/360.

MINIMUM SYSTEM REQUIREMENTS - Any System/360 configuration which includes a 7-track tape drive, and which utilizes Operating System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-12.1.013 *M
360/1620 DATA DISK GENERATION FROM 1401 7-TRACK TAPE

AUTHOR: D. M. Knight

DIRECT TECHNICAL INQUIRIES TO:
D. M. Knight
Norden Div. of United Aircraft Corp.
Norwalk, Conn.

*** S UAN - 06.5 06.6 - - - - - ***

DESCRIPTION - This stand-alone utility deck reads a 7 track 1401 tape (block size equals 2120, record length equals 106) that has been prepared from a 1620 - 1311 Disk Pack. The data is put through a character conversion and written on a 2311 disk in 1620 compatibility format. The method used is byte by byte scan of data, moving flags to flag bytes and packing condense each 106 digit record to the 63 byte record used in 1620 compatibility. The disk must conform to compatibility specs and have been previously formatted using the standard 1620 compatibility disk formatting program. This program is designed for conversion of data disks, not program disks.

PROGRAMMING SYSTEMS - Source language is BPS. Assembler with all macros expanded.

MINIMUM SYSTEM REQUIREMENTS - System/360, one 7 track tape drive, one 2311 Disk Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121013

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-12.1.014 *M
TIRNKL - CONVERT PREST DECKS TO BCD FORMAT

AUTHOR: R. Waugh

DIRECT TECHNICAL INQUIRIES TO:
R. Waugh
TEXACO Inc.
Computer Services Dept.
P. O. Box 52332
Houston, Texas 77052

*** S TI - - - - - - - - ***

DESCRIPTION - TIRNKL has been written to convert 7094 "PREST" decks to the orginal BCD source format so that these decks may be processed by System/360. TIRNKL will also renumber the source decks in columns 77 through 80, pick up columns 8 through 11 from the applicable "IBSYS" control card (SIEFTC, SIBMAP, SIBCBC) and store it in

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columns 73 through 76 of depressable output. The user has the option of either tape or card output.

PROGRAMMING SYSTEMS - Source language used is ALP.

MINIMUM SYSTEM REQUIREMENTS - Those required for BOS. In addition, the Column Binary feature on the card reader.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121014

Indicate "E N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-12.1.015
HONEYWELL 200 SERIES TO SYSTEM/360 DATA CONVERSION UTILITY

AUTHOR: S. F. Scott

DIRECT TECHNICAL INQUIRIES TO:
S. F. Scott
IBM Corporation
520 Boylston Street
Boston, Mass. 02116

*** N - - 00.3 06.5 - - - - - ***

DESCRIPTION - This is a generalized utility program, written in S/360 DOS Assembly Language, with functions controlled by console entries. It accepts either card or tape input prepared on Honeywell Series 200 equipment (without the magnetic tape compatibility feature) and translates that data into System/360 EBCDIC representation. Card input can produce either tape or card output; tape input can have only tape output. A second, optional, function of the program is zero filling of blank or partially blank numeric fields as defined by control cards. It will handle up to 1100 numeric fields and up to 10 different kinds of cards. Two other optional functions will strip banner characters from tape records and delete tape header labels.

PROGRAMMING SYSTEMS - Written in System/360 DOS Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 required to operate DOS, 2540 if card input or output is desired, one 7 track tape drive for tape input, one other tape drive for tape output, console typewriter, a 20K partition.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.1.016
CONVERT FORTRAN SOURCE FROM BCD TO EBCDIC

AUTHOR: J. C. Carney

DIRECT TECHNICAL INQUIRIES TO:
J. C. Carney
IBM Corporation
225 W. Virginia Beach Blvd.
Norfolk, Va.

*** N - - 00.1 06.5 - - - - - ***

DESCRIPTION - "Convert" is a utility type program, designed to run under DOS, which will take data cards punched in BCD (HN arrangement) and repunch them in EBCDIC. Although the FORTRAN compiler will accept BCD input certain operating conditions of the users system make it desirable to convert FORTRAN source decks from BCD to EBCDIC. Among these operating conditions are the replacement of 026 card punches with 029 card punches and the use of a print chain other than HN on the system printer.

PROGRAMMING SYSTEMS - Written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Those needed to run the Disk Operating System.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

CONTINUED FROM PRIOR COLUMN

360D-12.1.017
UNIVAC 490 SERIES - S/360 DATA TAPE CONVERTER

AUTHOR: J. L. Adcock

DIRECT TECHNICAL INQUIRIES TO:
J. L. Adcock
IBM Corporation
520 Boylston Street
Boston, Mass. 02117

*** N - - - - - - - - - ***

DESCRIPTION - This generalized program converts UNIVAC 490 series tape to 360 tape by generating a program from control cards. Control cards allow the user to specify input/output and record size, convert to binary, signed or unsigned packed decimal and double precision packed decimal, or alpha field data and translate up to eight different record types per tape. The program can be of great value during U490 to IBM S/360 program conversion.

PROGRAMMING SYSTEMS - The translator program is written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - A System/360 32K tape system, with at least one 7-track drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.1.018
HONEYWELL COBOL-D TO S/360 DOS COBOL CONVERTER

AUTHOR: R. R. Elliott

DIRECT TECHNICAL INQUIRIES TO:
R. R. Elliott
IBM Corporation
1365 Peachtree Street, N. E.
Atlanta, Georgia 30309

*** N - - - - - - - - - ***

DESCRIPTION - This program converts Honeywell COBOL-D to S/360 DOS COBOL. The output of the program is ready to be submitted for compilation. Some statements are not converted due to being split over several cards in such a way that they cannot be assembled into one statement. Most statements that are spread over several cards will be converted correctly. Input-output units are changed to S/360 types, (working-storage) is initialized, (correspondings) are expanded, (upon) and (from console) added if needed, most syntatical errors corrected. Line control is changed from (before) to (after) and the necessary changes made to give correct printer output.

PROGRAMMING SYSTEMS - Programming language - DOS ALP and IOCS.

MINIMUM SYSTEM REQUIREMENTS - 32K S/360-30, Decimal
MINIMUM SYSTEM REQUIREMENTS - 48K System/360, Decimal

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.1.020
PL/I BINARY TO EBCDIC CODE KEEPING FIVE BINARY CODED COLUMNS PRINTING RECODED DATA

AUTHOR: V. Diamond

CONTINUED FROM PRIOR PAGE

DIRECT TECHNICAL INQUIRIES TO:
V. Diamond
c/o Morgan Guaranty Trust Co. of New York - 24th F
23 Wall Street
New York, New York 10015

*** N - - 06.5 07.1 - - - - - ***

DESCRIPTION - The DOS PL/I PAKIT Program is designed to read column binary card images from tape, convert the binary to valid EBCDIC Graphics and EBCDIC Signed Data, selecting out up to five binary coded columns, replacing the column(s) with blanks(s) and storing binary information in order after the first 80 columns recoded output. Binary information will take two bytes i.e. 81 and 82, 83 and 84 input and output should be in the nine track mode, or 7 track with data convert. Data which cannot be recoded and has not been selected to be saved will be DYNDUMF as to contents, and printed as to position and then replaced by a blank.

Input block size 16000 Record length 160,
Output block size 9000 Record length 90,

Column control card follows with two digits for any column 01 to 80.

PROGRAMMING SYSTEMS - Written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.1.023 *N
CEFF - S/360 PIOCS PROGRAM TO COPY EMULATOR FOURTEEN HUNDRED FILES FROM 2311'S TO 2314'S

AUTHOR: L. A. Parks

DIRECT TECHNICAL INQUIRIES TO:
L. A. Parks
Bendix Automotive Service Division
822 Bryan
South Bend, Indiana 46635

*** N - - - - - - - - - ***

DESCRIPTION - The Copy Emulator Fourteen-Hundred Files, hereafter referred to as CEFF will provide complete support to convert Fourteen-Hundred data files on 1316' to 2316's. The user need not have any knowledge of Assembler or PIOCS to implement or use CEFF.

CEFF was written in S/360 mode in order to make an in-house conversion without the use of tape as an intermediate storage device. Also to increase run time by not switching between S/360 and compatibility mode.

PROGRAMMING SYSTEMS - Written in 360/DOS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run DOS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D121023

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.2.001
H400/S360 TRANSLATOR

AUTHOR: L. A. Whitney

DIRECT TECHNICAL INQUIRIES TO:
L. A. Whitney
IBM Corporation
701 West Broad Street
Bethlehem, Pa. 18016

*** N - - - - - - - - - ***

DESCRIPTION - This BPS program will convert H400 source

CONTINUED FROM PRIOR COLUMN

easy programs to S/360 source Al programs. The recommended translation effort is broken into four steps- (1) card-to-tape with the H400 source, (2) translation, creating S/360 Al source tape, (3) updating 360 source tape with manual corrections, or punching source tape and inserting manual corrections, (4) assembling and testing translated program.

PROGRAMMING SYSTEMS - This program is written in BPS.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 65K (Max. of 256K), decimal feature, 1052, 1 Sel Chan., 1403, 2540, timer (optional), 4 tapes minimum (at least 1 - 9 track), with 6 tapes max.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/1600	29	01
		MT 9/800	28	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-12.2.002
FORTRAN IV TO PL/I TRANSLATOR

AUTHOR: L. M. Leach

DIRECT TECHNICAL INQUIRIES TO:
Mrs. E. Jenson
Systems Documentation Dept.
Computation Center
Stamford University
Stamford, Calif. 94305

*** S STU FOPL - - - - - - - - ***

DESCRIPTION - This program translates FORTRAN IV as standardized by the American Standards Association (Communications of the ACM, Oct., 1964) to PL/I as defined by the IBM PL/I specifications (Form C28-6571). The Translator is written in PL/I and uses the method of recursive descent to accomplish the translation. The Translator produces readable PL/I output that requires minimum programmer effort to obtain a perfect translation. FORTRAN is assumed to have reserved words with significant blanks. Data, Equivalence, and Backspace statements are not translated. The Translator is written in a way to make it easily modifiable to include additional FORTRAN statements or accept a particular installation version of FORTRAN IV rather than the ASA standard.

PROGRAMMING SYSTEM - Written in PL/I and runs under the control of OS/360. (Requires PL/I (F) Compiler).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-12.2.004
MACRO CONVERSION - BOS TO DOS

AUTHOR: H. M. Hagerman

DIRECT TECHNICAL INQUIRIES TO:
H. M. Hagerman
IBM Corporation
1814 Madison Avenue
Toledo, Ohio 43624

*** N - - - - - - - - - ***

DESCRIPTION - The "Macro Conversion - BOS to DOS" program is a program to convert S/360 BOS coded Macros and DTF statements into DOS format. The primary function is to convert the general BOS DTFSR descriptions to specific DOS file descriptions. Also, the necessary changes to the DTFDA, DTFIS, DTFPH and other BOS Macros are included. (See Note 1).

This program contains major modifications and additions to the "BOS Source Conversion to DOS" program which is a Type III program submitted by Donald L. Coble of Tampa, Florida. Most of the modifications were incorporated to provide the necessary linkages between the DOS Logical IOCS and the user coded error routines for Index Sequential

CONTINUED FROM PRIOR PAGE

files.

Note 1: This program provides the conversion routines necessary for upgrading to DOS with a machine oriented conversion. Reprogramming is not required.

PROGRAMMING SYSTEMS - The program is Source Deck to Source Deck conversion written in S/360 BAL for use with DOS.

MINIMUM SYSTEM REQUIREMENTS - A system with 16K storage and minimum DOS configuration is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTICNAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.2.005
MODEL 44 PROGRAMMING SYSTEM LINKAGE EDITOR WITH MULTIPLE RELOCATABLE LIBRARY FEATURE

AUTHOR: R. R. Newson

DIRECT TECHNICAL INQUIRIES TO:
R. R. Newson
IBM Corporation
Federal Systems Division
2930 West Imperial Highway
Inglewood, Calif. 90303

*** N - - - - - - - - - - ***

DESCRIPTION - This program is a modification of System/360 Model 44 Programming System's (44P/S) Linkage Editor (ver/mod 3-0; phase, BKLNKEDT). It is designed to allow 44P/S programmers to access several independent relocatable object module libraries.

The use of this program allows the user of the 44P/S system to greatly increase the speed of execution of the linkage editor step. This is particularly convenient if the system is used for divergent applications requiring special application oriented modules. The size of the Relocatable Library is thus reduced and need only contain those modules used frequently. The program also makes possible the use of programmer oriented test libraries.

PROGRAMMING SYSTEMS - This program operates under control of System/360 Model 44 Programming System (44P/S), and extends the Linkage Editor capability to the inclusion of up to six additional relocatable libraries. It may be run as a single or multiple phase program. Specific relocatable modules may be located either by the AUTOLINK feature, or directly by use of an additional parameter in the INCLUDE card operand field. For users of 44P/S with large Relocatable Library needs, this modification greatly reduces the execution time of the Linkage Editor step, and the size of SDSREL.

MINIMUM SYSTEM REQUIREMENTS - The program operates under System/360 Model 44 Programming System's (44P/S) with at least 64K bytes of core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.2.006
ELECTRONIC SYSTEM CONVERSION OF AUTOCODER PROGRAMS

AUTHOR: J. Whitfield

DIRECT TECHNICAL INQUIRIES TO:
J. Whitfield
IBM Corporation
Baltimore Commercial
2330 St. Paul Street
Baltimore, Maryland 21218

*** N - - - - - - - - - ***

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DESCRIPTION - This program translates 1401, 1440, or 1460 AUTOCODER source programs to S/360 DOS A.L.C. or S/360 Mod 20 DPS or TPS source programs and is not a demonstration program. The program is submitted to help users get into 360 mode exclusively.

PROGRAMMING SYSTEMS - This program is written in 360 DOS Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - Any system using DOS with 32K and the packed decimal feature is sufficient to execute this program.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.2.007
EXPERIMENTAL FORTRAN DECOMPILER

AUTHOR: I. M. Miller

DIRECT TECHNICAL INQUIRIES TO:
I. M. Miller
IBM Corporation
South Road
P.O. Box 390
Poughkeepsie, New York 12601

*** N - - 05.3 - - - - - - ***

DESCRIPTION - The Decompiler will translate object decks generated by BPS FORTRAN or FORTRAN E back to FORTRAN statements which generated the deck. The program is useful to those who have lost their source decks or who wish to familiarize themselves with the Assembly Language code generated by the FORTRAN Compiler. The program has been tested on over 150 FORTRAN programs giving a reliability of about 95 percent.

PROGRAMMING SYSTEMS - Programming language - Assembly Language. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - 256K with two disk drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.2.008
CDC - 3800/3300 COBOL TO IBM - S/360 COBOL TRANSLATOR

AUTHORS: M. Chamberlain D. Beaner

DIRECT TECHNICAL INQUIRIES TO:
M. Chamberlain
IBM Corporation
1602 W. Third Ave.
Flint, Michigan 48504

*** N - - - - - - - - - ***

DESCRIPTION - Program to aid in CDC to IBM conversion where COBOL is the language of the programs to be converted. Two versions of the translator program exist. One version translates CDC-3800 COBOL to IBM S/360 level F COBOL, the other version translates CDC-3300 COBOL to IBM S/360 level E COBOL.

PROGRAMMING SYSTEMS - 3800COBT is written in COBOL and utilizes OS/MVT. 3300COBT is also written in COBOL; utilizing DOS.

MINIMUM SYSTEM REQUIREMENTS - 3800COBT has storage requirements of 100K (region) and operates on an S/360-40,50 or 65. 3300COBT has storage requirements of 52K (problem area) and operates on an S/360-30.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.

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MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-12.2.009 *M

NCR 315 TRANSLATOR FROM NEAT TO 360 ALP

AUTHOR: N. Stewart

DIRECT TECHNICAL INQUIRIES TO:
N. Stewart
IBM - New York Retail
330 Madison Avenue
New York, New York 10017

*** N - - - - - - - - - - ***

DESCRIPTION - A program to translate National Cash Register 315 "NEAT" programs to 360 ALP program.

PROGRAMMING SYSTEMS - The program translates from source to source. It is written in 360 Assembler language.

MINIMUM SYSTEM REQUIREMENTS - Requires a 48K 360/25 or any larger 360 with two 9 track tape drives, a printer, a card read/punch, one disk drive plus DOS SYSRES. For tape input a 7 track drive is needed, and for card input an 1130 must be used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D122009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-13.0.002

HOSPITAL SELECTIVE MENU PROCESSING PROGRAM

AUTHOR: A. Simonetti

DIRECT TECHNICAL INQUIRIES TO:
A. Simonetti
IBM Corporation
112 East Post Road
White Plains, New York 10601

*** N - - - - - - - - - ***

DESCRIPTION - The Hospital Selective Menu Processing Program is applicable to the dietary departments of most hospitals. The program generates a dietetically suitable menu for each meal for each patient every day. Selective menus are printed on 1232 data recording sheets. Patients mark their choices of food items on these 1232 menus. These menus are then read by the IBM 1232 Optical Mark Page Reader to generate a deck of punched cards. The program processes these cards and generates total hospital food requirements and food requirements for each food preparation center in the hospital.

PROGRAMMING SYSTEMS - Written in source-COBOL. Operating system required - Disk Operating System (DOS).

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 20, Model E (32K) CPU, 3 2311 Disk Drives, a 1232 Optical Mark Page Reader (and associated 534 Card Punch) and other standard peripheral equipment.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D130002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.0.003

REMOTE ACCESS STATISTICAL SYSTEM

AUTHOR: H. J. Tauchi

DIRECT TECHNICAL INQUIRIES TO:
H. J. Tauchi
IBM Corporation
1930 Century Park West
Los Angeles, California 90067

*** N - - 16.0 17.0 24.2 25.2 - - - ***

DESCRIPTION - The Remote Access Statistical System permits the user to interact with the computer through 1050 and 2260 terminals while he is performing statistical analyses. The system provides 21 different statistical analyses, format-free input, many alternatives, extensive error checking and protection, and tutorial instructions. The communication between the user and the computer is carried out in a conversational manner; thus, the user can solve his problem from a remote terminal without knowing anything about the computer and programs. The system can be of great value when it is used in educational and research institutions.

PROGRAMMING SYSTEMS - Written in BPS FORTRAN, except one small program written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - The system runs under the Remote Access Computing System for System/360 with the minimum core storage of 128K bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D130003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-13.0.004 *N

GRAPHICS STEPWISE REGRESSION ROUTINE (BMDGR1)

AUTHOR: L. Engelman J. Douglas

DIRECT TECHNICAL INQUIRIES TO:
J. Douglas
HSCH, UCLA
Los Angeles, Calif. 90024

*** N - - 13.6 - - - - - - ***

DESCRIPTION - BMDGR1 computes multiple linear regression in a stepwise manner. At each step the user can change parameter values from the keyboard. Displays of the selected statistical results, along with the analysis of variance table comparing the sum of squares about and due to the regression are available on request. The user can also call for display of either the correlation, covariance or the partially inverted covariance matrix. The values of the selected variables can be displayed and deviations from the mean are indicated in standard deviation units. A summary display gives a summary table of each step that has been executed.

PROGRAMMING SYSTEMS - Written on an IBM System/360 Model 75I, using FORTRAN IV and the GRAF subroutines developed at the Health Sciences Computing Facility. GRAF is required to run this program; it may be ordered from PID (360D-03.8.010).

MINIMUM SYSTEM REQUIREMENTS - 85560 bytes of memory, a printer (1403), a card reader (2540), a disk drive (2314), and a 2250 Display Unit.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D130004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-13.0.005 *N

NON-LINEAR LEAST SQUARES ON GRAPHICS (BMDGR2)

AUTHOR: Laszlo Engelman

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DIRECT TECHNICAL INQUIRIES TO:
Laszlo Engelman
HSCF, U.C.L.A.
Los Angeles, Calif. 90024

*** N - - 13.6 - - - - - - ***

DESCRIPTION - This program obtains a set of values for the parameters Q(1), Q(2),...,Q(p) which minimizes the expression

$$\sum_{(\text{from } 1 \text{ to } N)}^{(\text{on } I)} (Y(I)-F(X(1,I),X(2,I),\ldots,X(T,I),Q(1),Q(2),\ldots,Q(p))^{**2}$$

by means of stepwise Gauss-Newton iteration on the parameters Q(1), Q(2),...,Q(p). The data values Y(I), X(1,J),...,X(T,I),I-1,2,...,N are the observations of T + 1 variables in N cases; and F is a user-specified function. The user may specify up to 18 functions. The selection of one of the user-specified functions is done via either the light pen or the keyboard, and may be changed at any time while the program is running. The program displays results in five frames. The user can direct the rcutine to display any one of these frames at any time.

PROGRAMMING SYSTEMS - This program was written for the IBM System/360 Model 75, using FORTRAN IV and the GRAF Facility.

MINIMUM SYSTEM REQUIREMENTS - 11391210 bytes of memory, a Printer (1403), a Card Reader (2540), a disk drive, and a 2250 Display Unit.

BASIC PRCGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFCRMATION: PROGRAM NUMBER 360D130005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-13.0.006 *N
TIME SERIES SPECTRUM ESTIMATION (BMDGT1)

AUTHOR: R.I. Jennrich F.J. Massey, III
M.B. Brown K. Yamasaki

DIRECT TECHNICAL INQUIRIES TO:
Koji Yamasaki
U.C.L.A.
Los Angeles, Calif. 90024

*** N - - 13.4 - - - - - - ***

DESCRIPTION - This program estimates auto-spectra, cross-spectra and coherences for stationary time series. Each series is decomposed into frequency components by means of a finite Fourier transform and the required estimates are obtained by summing products of the transformed series. Linear trend is removed from each series before detrending. The use of the fast transform algorithm makes this program execute very fast and allows it to resolve a much larger number of frequency bands. Two-sided spectra are used throughout. This leads to estimates which are one-half those obtained from programs using one-sided spectra.

PROGRAMMING SYSTEMS - BMDGT1 was written on an IBM System/360 Model 75I, using FORTRAN IV(G) and the GRAF subroutines develcped at the Health Sciences Computing Facility. GRAF is required to run this program; it may be ordered from PID (360D-03.8.010).

MINIMUM SYSTEM REQUIREMENTS - 1403 Printer, 2540 Card Reader, a disk drive, and a 2250 Display Unit.

BASIC PRCGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFCRMATION: PROGRAM NUMBER 360D130006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-13.0.008 *N
CAI DOS COURSEWRITER III CALCULATOR

AUTHOR: Bill Burr

DIRECT TECHNICAL INQUIRIES TO:

CONTINUED FROM PRIOR CCLUMN

Mrs. Julie Hushak
410 W. 10th Avenue
Columbus, Ohio 43210

*** N - - 40.0 99. - - - - - ***

DESCRIPTION - The S/360 CAI DOS COURSEWRITER III Calculator is designed to give the student of a Coursewriter III course ability to request mathematical computations via the terminal while he is signed on in any course. The two subroutines are easily implemented into an existing DOS Coursewriter III system as explained in the Coursewriter III Programmers Guide. The 'CALC' routine is handled very much like 'HELP'. The CAI compiler reads input in algebraic form expressions sometimes seem ambiguous, the compiler has algebraic expressions sometimes seem ambiguous, the compiler has definite rules for resolving all legal expressions as clearly defined in the documentation.

PROGRAMMING SYSTEMS- Wriiten in DOS Assembler Language; this function consists of three disk resident subroutines which may be loaded on any DOS Coursewriter III system (Version 2).

MINIMUM SYSTEM REQUIREMENTS - May be found in the Coursewriter III Application Directory distributed with that program (360A-UX-01X).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PRCGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D130008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.0.009 *N
HISTOGRAM SUBROUTINE

AUTHOR: G. M. Hardt

DIRECT TECHNICAL INQUIRIES TO:
G. M. Hardt
Insurance Data Processing Center
116 John Street
New York, New York 10038

*** S IDP - 08.6 - - - - - - ***

DESCRIPTION - The Histogram Subroutine draws a histogram and computes mean, variance, skewness and range for variables stored in an array in the calling program. The subroutine features automatic frequency scaling and five options which allow the drawing of every possible histogram type (discrete distributions, variable class intervals, etc.).

PROGRAMMING SYSTEMS - Written in FORTRAN IV G.

MINIMUM SYSTEM REQUIREMENTS - Tested extensively on OS/360 Models 40 and 65.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATICN: PROGRAM NUMBER 360D130009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	*DTR	00	none
OPTIONAL	none	none		none

360D-13.1.005
GENERAL TAXONOMY PROGRAM

AUTHOR: H. Personen

DIRECT TECHNICAL INQUIRIES TO:
H. Personen
Dept. of Geography
University of Oulu
Oulu 2, Finland

*** N - - 17.5 17.6 - - - - ***

DESCRIPTION - This program allocates a set of individuals into groups. Each group has typical individual and the members of the group are all sufficiently similar to the type. The user defines the similarity needed. The types are determined tc carry information of their group members only. The variables are quantitative ones. With some changes in the program qualitative could be used also.

PROGRAMMING SYSTEMS - Written in Basic FORTRAN IB, and

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has been compiled and tested using TOS Version 11 on a S/360 Model 30. It could be used in other operating systems also. To get a complete understanding of the method it is necessary to read the write-up.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for a S/360 Model 30.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D131005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.2.003
LEAST-SQUARES ESTIMATION OF NON LINEAR -LINEAR PARAMETERS-NLIN

AUTHOR: J. A. Middleton

DIRECT TECHNICAL INQUIRIES TO:
H. R. Hamilton
Computing Center, N.C. State University
Box 5445
Raleigh, North Carolina 27607

*** S NCS - 13.6 44.2 - - - - - ***

DESCRIPTION - A main program based on an IBM 7000-series program by D. W. Marquardt of E. I. duPont de Nemours & Co., Inc. (SHARE SDA 3094.01) to perform estimation of parameters in non-linear functions which are defined by user supplied subroutines.

PROGRAMMING SYSTEMS - Rewritten for S/360 in PL/I with greater I/O flexibility and ability for user supplied functions to be written in FORTRAN or PL/I.

MINIMUM SYSTEM REQUIREMENTS - The storage required depends upon the complexity of the functions being fit and the number of data points but for "small" problems, a partition of 84K is sufficient.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D132003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.3.001
SPEARMAN RANK - CORRELATION COEFFICIENT COMPUTATION S/360

AUTHOR: R. L. Bulinski

DIRECT TECHNICAL INQUIRIES TO:
R. L. Bulinski
IBM Corporation
3424 Wilshire Boulevard
Los Angeles, California 90005

*** N - - 13.6 - - - - - - ***

DESCRIPTION - The program computes the correlation between the rankings on two attributes within a sample comprising N observations. The attributes being ranked might be test (or course) grades in two subjects, or aptitude and achievement scores, etc. (in these examples, each student comprises an observation). Ranks for each attribute as the correlation are computed by the program, according to the Spearman convention. The source program is compatible with DOS FORTRAN and 1130 FORTRAN with appropriate changes of I/O unit logical addresses. As dimensioned in the source program, up to 99 observations are accepted, with up to three-digit raw scores for each of the attributes. In this form, the object program occupies 4034 bytes including data storage. Input is in card form, with a control card stating the value of N, followed by the raw scores for both attributes at one observation per card. Multiple samples may be stacked. Output is printed on-line.

PROGRAMMING SYSTEMS - Written in BPS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

CONTINUED FROM PRIOR COLUMN

ORDERING INFORMATION: PROGRAM NUMBER 360D133001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.4.001
COOLEY-TUKEY FAST FOURIER TRANSFORM

AUTHOR: N. Brenner

DIRECT TECHNICAL INQUIRIES TO:
N. Brenner
MIT Lincoln Laboratory
P. O. Box 73
Lexington, Massachusetts 02173

*** S LL FFTT 44.3 44.0 - - - - - ***

DESCRIPTION - Subroutine FOURT (DATA,NN,NDIM,ISIGN,IFORM,WORK). The Cooley-Tukey Fast Fourier Transform in USASI Basic FORTRAN. Transform (k1,k2,...) equals SUM(data(j1,j2,...)*EXP (ISIGN*2*PI*SQRT(-1)*((j1-1)*(k1-1))/NN(1) plus (j2-1)*(k2-1)/(NN (2) plus...///, summed for all j1,k1 between 1 and nn(1), j2,k2 between 1 and nn(2), etc. There is no limit to the number of subscripts. Data is a multidimensional complex array (i.e., the real and imaginary parts are adjacent in storage, such as FORTRAN IV places them). If all imaginary parts are zero (data are disguised real), set IFORM to zero to cut the running time by up to forty per cent. Otherwise, IFORM equals plus 1. The lengths of all dimensions are stored in array NN, of length NDIM. They may be any positive integers, though the program runs faster on composite integers, and especially if a minus 1 transform is followed by a plus 1 (or vice versa) the original data reappear, multiplied by NTOT (equals NN(1)*NN(2)*...). Transform values are not always complex, and are returned in array data, replacing the input. In addition, if all dimensions are not powers of two, array work must be supplied, complex of length equal to the largest non 2**k dimension. Otherwise, replace work by zero in the calling sequence. Normal FORTRAN data ordering is expected, first subscript varying fastest. All subscripts begin at one. Running time is much faster than the naive NTOT**2, being proportional to NTOT*(sum of the prime factors of NTOT plus CONST*(number of factors other than twos)). Accuracy is also greatly improved, as the RMS relative error is bounded by 3*2**(-b)*SUM((prime factor)**1.5), where b is the number of bits in the floating point fraction. This is the fastest and most versatile version of the FFT known to the author.

PROGRAMMING SYSTEMS - Written in USASI Basic FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - 8K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.4.002
COOLEY-TUKEY FAST FOURIER TRANSFORM

AUTHOR: N. Brenner

DIRECT TECHNICAL INQUIRIES TO:
N. Brenner
MIT Lincoln Laboratory
P. O. Box 73
Lexington, Massachusetts

*** S LL FFT1 43.3 44.0 - - - - - ***

DESCRIPTION - Fast on numbers rich in factors of two. ISIGN is plus 1 or minus 1. Subroutine FOUR1 (DATA,NN,ISIGN). The Cooley-Tukey Fast Fourier Transform in USASI Basic Fortran. Transform(k) equals SUM(data(j)*EXP(ISIGN*2*PI*SQRT(-1)*(j-1)* (K-1(NN)), summed over all j and k from 1 to NN. Data is a one-dimensional complex array (i.e., the real and imaginery parts are adjacent in storage, such as FORTRAN IV places them) whose length NN equals 2**k, K.GE.0. (If necessary, append zeroes to the data). ISIGN is plus 1 or minus 1. If a minus 1 transform is followed by a plus 1 (or vice versa) the original data reappear, multiplied by NN. Transform values are returned in array data, replacing the input. The time is proportional to NN*LOG2(NN), rather than the naive NN**2. Accuracy is also greatly improved, the RMS relative error bounded by 6*SQRT(2)*LOG2(NN)*2**(-b), where b is the number of bits in the floating point fraction.

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PROGRAMMING SYSTEMS - Written in USASI BASIC FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - 8K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.4.003
COOLEY-TUKEY FAST FOURIER TRANSFORM-FOUR2

AUTHOR: N. Brenner

DIRECT TECHNICAL INQUIRIES TO:
N. Brenner
MIT Dept. of Geophysics
77 Massachusetts Avenue
Cambridge, Massachusetts 02139

*** FFT2 43.0.44.0 - - - - - ***

DESCRIPTION - SUBROUTINE FOUR2(DATA,N,NDIM,ISIGN,IFORM). The Cooley-Tukey Fast Fourier Transform in USASI Basic FORTRAN for multi-dimensional power of two sized arrays. For N data points, FOUR2 runs in time proportional to N*log2(N), while non-FFT methods run in N**2. For large N, this is seconds versus hours. The FFT is the fastest and most accurate way of computing periodograms of time series, convolutions and correlations, Fourier coefficients, digital filters, partial differential equations, etc. See IEEE Transactions on Audio and Electroacoustics (June 1967).

DATA is an array of floating-point data which is transformed and replaced with the transform values. It may be complex, real or conjugate-symmetric complex (IFORM=1, 0 or 1). The latter cases run in half the time and half the storage of the first. N is an array of length NDIM giving the dimensions of DATA. NDIM is unrestricted. Each N(I) must be a power of two. (Data may be padded with zeroes to achieve a power of two length). ISIGN is =1 or -1, the transform direction.

PROGRAMMING SYSTEMS - Written in USASI BASIC FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - 8K core storage, Models 25 and above.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.4.004
PROCESSING MODELING AND CONTROL-DESIGN PACKAGE

AUTHOR: Torsten Bohlin Sture Wensmark

DIRECT TECHNICAL INQUIRIES TO:
Torsten Bohlin
IBM Nordic Laboratory
Box 962
Lindingo 9, Sweden

*** N - - 13.6 16.3 16.0 - - - - ***

DESCRIPTION - This is a program package, comprising two FORTRAN programs to analyze continuous industrial processes. The first program analyses a record of repeated measurements, equally spaced in time, of a number of manipulated variables and one dependent variable. It produces a representation of the sample in the form of mathematical and statistical models of the process and its disturbances. The second program calculates various conventional process and disturbance characteristics, and/or an optimal control law. Application is limited to processes that can be described by a linear, single-output, time-invariant, dynamic model, superposed by a normal random time-series with time-invariant power spectrum. Diagnostic tests are included. The package should reduce systems engineering work needed to apply process control computers, in particular when the process has complicated dynamics and significant time-delays, in slow-reacting, and substantially disturbed during running conditions.

CONTINUED FROM PRIOR COLUMN

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40 with DOS or TOS. The core storage requirement is 128K bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-13.4.005
COOLEY-TUKEY FAST FOURIER TRANSFORM -- FOURG

AUTHOR: N. Brenner

DIRECT TECHNICAL INQUIRIES TO:
N. Brenner
MIT Dept. of Geophysics
77 Mass. Avenue
E. Cambridge, Mass. 02139

*** N - FFTG 43.3 44.0 - - - - - ***

DESCRIPTION - A very short (142 cards) version of the Cooley-Tukey Fast Fourier Transform. For N data points, FOURG runs in time proportional to N log N, while pre-FFT methods run in N**2. For large N, this is seconds versus hours. The FFT is the fastest and most accurate way of computing periodograms of time series, convolutions and correlations, Fourier coefficients, digital filters, partial differential equations, etc.

DATA is a complex, one-dimensional array of floating-point data which is transformed and replaced with the transform values. N. is the length of array of DATA. It may be any positive interger, even prime. ISIGN is the transform direction, +1 or -1. WORK is a complex, one-dimensional array of length N which is used for working storage.

PROGRAMMING SYSTEMS - Written in USASI Basic FORTRAN. The operating system requirements are - FORTRAN Compiler (any level), minimum model number-any with FORTRAN (e.g. Model 25).

MINIMUM SYSTEM REQUIREMENTS - Core required is 4K bytes (estimate) plus the system subroutines, no I/O devices are needed.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.4.006
COOLEY-TUKEY FAST FOURIER TRANSFORM ON DIRECT ACCESS STORED DATA

AUTHOR: N. Brenner

DIRECT TECHNICAL INQUIRIES TO:
N. Brenner
MIT Dept. of Geophysics
77 Mass. Avenue
E. Cambridge, Mass. 02139

*** N - FF2D 43.3 44.0 - - - - - ***

DESCRIPTION - Subroutine FOR2D (IDATA, N, NDIM, ISIGN, IFORM, WORK, NELEM) for N data points, FOR2D runs in time proportional to N log N, while pre-FFT methods run in N**2. For large N, this is seconds versus hours. The FFT is the fastest and most accurate way of computing periodograms of time series, convolutions and correlations, Fourier coefficients, digital filters, partial differential equations, etc. DATA is a complex, multi-dimensional array of data kept on direct access storage in file IDATA, in records of length NELEM. N is an array of length giving the dimensions of DATA. NDIM is unrestricted; each N(I) must be a power of two, as must NELEM. ISIGN = +1 or -1, the transform direction. IFORM = 1. WORK is a one-dimensional complex array of length 3*NELEM used for input/output buffers. The user must supply two subroutine, DREAD and DWRIT, for reading and writing records in

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arbitrary order to and from the direct access storage device (disk, drum, etc., but not tape).

PROGRAMMING SYSTEMS - Programming language - USASI Basic FORTRAN. Operating system required - BOS, DOS, or OS.

MINIMUM SYSTEM REQUIREMENTS - S/360, Model 30 with 64K core storage, card reader, disk files, and printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.4.007 *N
RESCALED RANGE TRANSFORM

AUTHOR: J. R. Wallis

DIRECT TECHNICAL INQUIRIES TO:
J. R. Wallis
IBM, Thomas J. Watson Res. Ctr.
P.O. Box 218
Yorktown Hts., New York 10598

*** S PK - 17.4 - - - - - - ***

DESCRIPTION - Given an ordered array of observations (3.LE.T.LE.10000) this FORTRAN program calculates the Rescaled Range Transform, R(t,s)/S(t,s), at lags s equal to 3, 4, 5, 7, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 150, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1500, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, and 10000, starting from 15 uniformaly spaced origins (t=T/15). The mean and median values of R(s)/S(s) at each lag are determined. If an IBM 1627 plot package is available at the installation then a simple modification should enable the user to draw 'R(t,s)/S(t,s) pox diagrams'. For a full reference on this subject see the papers by Mandelbrot and Wallis in the 1968 and 1969 issues of Water Resources Research.

PROGRAMMING SYSTEMS - Written in FORTRAN; operates using OS/360.

MINIMUM SYSTEM REQUIREMENTS - A System/360 with 110K bytes available to the problem program.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-13.4.008 *N
COOLEY-TUKEY FAST FOURIER TRANSFORM -- FOUR 2 IN ASSEMBLER LANGUAGE

AUTHOR: N. Brenner

DIRECT TECHNICAL INQUIRIES TO:
N. Brenner
MIT Dept. of Geophysics, Rm. 54-710
77 Massachusetts Avenue
Cambridge, Mass. 02139

*** N MIT FFT2A 43.3 44.0 - - - - - ***

DESCRIPTION - SUBROUTINE FOUR2 (DATA,N,NDIM,ISIGN,IFORM). This is a partial rewrite of FOUR2 (PID 360D-13.4.003) into OS/360 Assembly Language. On 360/67-2, it runs approximately twice as fast as FOUR2 compiled in FORTRAN G, thirty percent faster than in FORTRAN H, OPT=2. Complete compatibility with the FORTRAN version is maintained. Specifically, running time for an N-point (N a power of two), multi-dimensional array is proportional to N*log2(N), 25*N*LOG2(N) microsec on 360/67-2, rather than the naive N**2. Real arrays are transformed in half the space and half the time of complex arrays. Further, data may be either short or long floating point, the choice being made by a switch at assembly time.

PROGRAMMING SYSTEMS - Written in Assembly language.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run OS/360 and has a minimum of 8K storage.

CONTINUED FROM PRIOR COLUMN

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D134008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-13.6.001
STEPWISE MULTIPLE REGRESSION PROGRAM

AUTHOR: M. P. Rosenthal

DIRECT TECHNICAL INQUIRIES TO:
M. P. Rosenthal
IBM Corporation
340 Market Street
San Francisco, California

*** N - - 06.5 - - - - - - ***

DESCRIPTION - This program performs a step-wise regression analysis on up to 9999 sets of observations on one dependent variable and up to 57 explanatory variables. The program allows for nine types of algebraic transformations of original data. Output consists of means, standard deviations, simple correlation coefficients, and step-wise results. Step-wise results consist of the standard error of estimate, the multiple correlation coefficient, F, constant term, and regression coefficients and their standard deviations, students T/S, and Beta coefficients. Output of residuals is optional.

PROGRAMMING SYSTEMS - Written in FORTRAN and operates under BPS.

MINIMUM SYSTEM REQUIREMENTS - Requires 32K and BPS FORTRAN features for compilation and execution.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.6.003
NONLINEAR PARAMETER ESTIMATION AND PROGRAMMING

AUTHOR: Y. Bard

DIRECT TECHNICAL INQUIRIES TO:
Y. Bard
IBM Corporation
New York Scientific Center
590 Madison Avenue
New York, New York 10022

*** S ISN NLPE 15.3 17.3 16.3 13.2 - - - ***

DESCRIPTION - The program is designed to solve the following problems - estimate unknown parameters in nonlinear mathematical models, using any of the following techniques- Least Squares, Weighted Least Squares, Maximum Likelihood, Bayesian Estimation. Special provisions are included for models involving solutions of Ordinary Differential Equations, and for Chemical Reaction Kinetics equations. Constraints may be imposed on the parameter values... solve nonlinear programming problems... solve simultaneous equations, two point boundary value problems, and other problems which can be cast in the form of one of the two above mentioned forms.

PROGRAMMING SYSTEMS - Written in lowest level FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - IBM System/360 under the OS or BPS Monitors.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none

CONTINUED FROM PRIOR PAGE

		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-13.6.004
PROGRAM TO PLOT CONTOURS OF CONSTANT RESPONSE FOR THE SYSTEM/360

AUTHOR: J. L. Tate

DIRECT TECHNICAL INQUIRIES TO:
J. L. Tate
W. R. Grace & Co.
Dewey & Almy Chemical Division
62 Whittemore Avenue
Cambridge, Massachusetts 02142

*** C 1191 CONT - - - - - - - - ***

DESCRIPTION - This program will print contours of constant y for a quadratic function of up to 20 independent variables (x) including all cross-products. It allows for specifying the x's on the axes and the ranges and increments of all x's and y. It will print separate plots of all combinations of the x's not on the axes. The program is most useful in presenting the output of a regression analysis or in the pictorial representation of any quadratic mathematical model.

PROGRAMMING SYSTEMS - The program is written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30 CPU, a line printer on SYSLST, and a 2540 card reader on SYSIPT, and a 2311 Disk Drive for compilation and storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.6.005
NON-LINEAR REGRESSION EQUATIONS AND SYSTEMS, ESTIMATION AND PREDICTION, IBM S/360

AUTHOR: H. Eisenpress

DIRECT TECHNICAL INQUIRIES TO:
H. Eisenpress
IBM Corporation
N.Y. Scientific Center
410 E. 62nd Street
New York, N.Y. 10021

*** N - - - - - - - - - ***

DESCRIPTION - This program estimates the parameters of a non-linear regression equation and/or system. The equation or system may be non-linear in the parameters and/or dependent variables. A typical application is to econometric systems, where equations may be solved separately (ordinary least squares) or simultaneously (full information). Predicted values of the dependent variables may also be computed (reduced forms) for given values of the independent variables. The program is a natural extension to the non-linear area of the widely-used statistical technique, linear regression.

PROGRAMMING SYSTEMS - Programming language - PL/I and FORMAC. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40 H-level or higher.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.6.006 *M
TOTAL SCAN MULTIPLE REGRESSION ANALYSIS WITH STANDARD ERROR OPTIMIZATION ROUTINE

CONTINUED FROM PRIOR COLUMN

AUTHORS: J.F. Kruse A.W. Cywar

DIRECT TECHNICAL INQUIRIES TO:
J.F. Kruse
IBM Corporation
Building 684-1
Endicott, New York 13754

*** N - - - - - - - - - ***

DESCRIPTION - This abstract concerns a statistical program which performs a linear multiple regression analysis with up to ten independent variables. This program is unique in that, given variables, all possible regression equations (the number of equations possible is calculated by summing from J=1 to J=N, the expression: N factorial divided by the quantity found by multiplying J factorial and (N-J) factorial) are developed with their corresponding corrected standard error of estimate. The user can select any or all of the equations to be outputed. Of primary benefit, he can request the equation with the minimum standard error of estimate. Thus, one can screen out those variables which contribute little or negatively to a regression analysis. This capability is valuable whenever anyone is not completely confident in his selection of independent variables.

PROGRAMMING SYSTEMS - Source language - FORTRAN IV; runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 50 or Model 65.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.6.007
NON-LINEAR LEAST SQUARES CURVE FITTING PROGRAM

AUTHOR: F.S. Wood

DIRECT TECHNICAL INQUIRIES TO:
H.W. Nelson, Mgr.
Technical Systems Division-IS*CS
American Oil Company
P. O. Box 6110±, Chicago, Illinois 60680

*** S IN 1190 16.0 17.0 27.0 44.2 - - - ***

DESCRIPTION - This computer program allows the user to estimate the coefficients of non-linear equation

$$\frac{2}{\text{equation such as } Y = A / (X + B) \text{ and } Y = Ax + C} \quad \frac{B}{}$$

-- equations that are non-linear in the coefficients. An iterative technique is used; the estimates at each iteration are obtained by Marquardt's Maximum Neighborhood Method which combines the Gauss (Taylor Series) Method and the Method of Steepest Descent. Since numerous forms of equations can be used, the user must specify the form by providing a subroutine to compute the values of the equations coefficients. In addition, the user must provide a control card, a format card for reading data and estimates of the starting values of the coefficients. If desired, information cards and coefficient name cards can be read for display on the printout. Such displays are helpful to record the form of equation, the purpose of the run and any additional information that may help identify the printout in the future. Identification of the coefficients by name is particularly helpful when working with large or complex equations.

The output of the program is a printed report which includes a description of the problem, the starting values of the coefficients, the size of the incremental steps, a summary of each iteration and a summary of the final fit (in terms simular to those in the Linear Least-Squares Curve-Fitting Program). The statistics calculated include the number of observations, the number of coefficients, the residual degrees of freedom, the maximum and minimum value of the dependent variable as well as its range, the standard error and t-value for each coefficient, the residual sum of squares, the residual mean square and the residual root mean square.

Listings are made of the observed and fitted values of the dependent variable--both in the sequence in which observations were given to the computer, and in the order of the magnitude of the differences between the observed and fitted values. Plots are made to indicate (1) whether these a description of the problem, the starting values of the coefficients, the size of the incremental steps, a summary of each iteration and a summary of the final fit (in terms simular to those in the Linear Least-Squares Curve-Fitting Program). The statistics calculated include the number of observations, the number of coefficients, the residual degrees of freedom, the maximum and minimum value of the dependent variable as well as its range, the standard error

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and t-value for each coefficient, the residual sum of squares, the residual mean square and the residual root mean square.

Listings are made of the observed and fitted values of the dependent variable--both in the sequence in which observations were given to the computer, and in the order of the magnitude of the differences between the observed and fitted values. Plots are made to indicate (1) whether these differences are normally distributed and (2) how they are distributed over all the fitted values of the dependent variable.

Provisions are made to run multiple problems as well as different equations using the same data. The program as dimensioned (256K) will handle up to 80 variables and 170 observations. Information is given in the program listings on which dimensions to change in order to reduce the overall dimensions or to increase either the number of variables or the number of observations the program will handle.

PROGRAMMING SYSTEMS - Written in CS FORTRAN IV H level.

MINIMUM SYSTEM REQUIREMENTS - A FORTRAN IV compiler, a card reader and a printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.6.008 *N
LINEAR LEAST-SQUARES CURVE FITTING PROGRAM

AUTHOR: H.W. Nelson

DIRECT TECHNICAL INQUIRIES TO:
H.W. Nelson
Technical Systems Division - IS&CS
American Oil Company
P.O. Box 6110A
Chicago, Illinois 60608

*** S IN 0072A 16.0 17.0 27.0 44.2 - - - ***

DESCRIPTION - This computer program allows the user to transform data into an appropriate form, fits specified equations to the transformed data by linear least-squares, and provides both statistics and plots to aid in evaluating the fit. A Cp-statistic search technique determines if smaller sets of the variables will represent the data equally well.

The transformations which are available to the user include reciprocals, sums, differences, products, quotients, logarithms, and exponentials. Such transformations are used to convert the observed data to more convenient or more rational units to add terms that are functions of the data-variables, to stabilize variance, and to omit variables.

In addition to the usual statistics, the program calculates the maximum and minimum value of each variable as well as its range, the relative influence of each variable and the weighted squared standardized distance of each observation from the centroid of all observations. Near neighbors are used to estimate the standard deviation of the dependent variable. A table of component effect of each variable on the fitted value of each observation shows which observations were influential in estimating the value of individual coefficients.

Listings are made of the observed and fitted values of the dependent variable--both in the sequence in which observations were given to the computer, and in the order of the magnitude of the differences between the observed and fitted values. Plots are made to indicate (1) whether these differences are normally distributed and (2) how they are distributed over all the fitted values of the dependent variable.

The program, as dimensioned, will handle up to 80 variables and 1000 observations. Multiple dependent variables are fitted one at a time and multiple forms of specified linear equations can be fitted with one data loading.

Information is given within the program on which dimensions to change in order to reduce the overall dimensions of the program or to increase either the number of variables or the number of observations the program will handle. The current overall dimensions of the program is 256K.

PROGRAMMING SYSTEMS - Written in CS FORTRAN IV H level.

MINIMUM SYSTEM REQUIREMENTS - The machine requirements are a FORTRAN IV compiler, a card reader, four scratch files and a printer.

CONTINUED FROM PRIOR COLUMN

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D136008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-13.7.001 *N
DIALL - GENERAL LEAST SQUARES DIALLEL ANALYSIS OF VARIANCE

AUTHOR: H.E. Schaffer R.A. Usanis

DIRECT TECHNICAL INQUIRIES TO:
H.E. Schaffer
Dept. of Genetics
N. C. State University
Raleigh, North Carolina 27607

*** S NCS - 17.5 - - - - - - ***

DESCRIPTION - Two main programs, DIALL and DIALLC, which do a general least squares analysis for a general (unbalanced) diallel experiment, are described in detail. The programs, with their subroutines, will compute the analysis of variance and analysis of cross-products tables for any number of variables including the expectations of the mean squares, calculate the estimates of the variance components and estimate the correlations between the effects for different traits. Two examples are given of the use of these programs. For a complete analysis of a 5 line diallel experiment with two replicates and one variable approximately 42K bytes of memory are needed. The memory requirements increase more rapidly than an increase in the number of lines.

PROGRAMMING SYSTEMS - Written in FORTRAN IV, G level and tested using OS/360.

MINIMUM SYSTEM REQUIREMENTS - Output records up to 132 characters are produced. No special equipment is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D137001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.0.001
STUDENT SCHEDULING SYSTEM/360, DOS VERSION

AUTHORS: T. C. Green Dorothy Grover

DIRECT TECHNICAL INQUIRIES TO:
T. C. Green
IBM Corporation
P. O. Box 1053
Oakland, California 94604

*** N - - 15.4 - - - - - - ***

DESCRIPTION - The programs produce aids to master schedule building (tally and conflict matrix) and, using a master schedule prepared by the school, process student course requests to create student schedules and an updated master schedule. The DOS sort is utilized to sort the schedule records into class list sequence. This package represents a conversion of the two Type II student scheduling System/360 packages (Tally and Conflict Matrix, Program No. 360A-US-06X, and the Scheduler, Program No. 360A-US-07X) which operate under BOS to DOS. This conversion allows an installation to maintain one operating system and use the student scheduling application package.

PROGRAMMING SYSTEMS - Student Scheduling System/360, DOS Version is written in Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30 with a minimum of 65K and three 2311's. The use of tape is optional.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D150001

CONTINUED FROM PRIOR PAGE

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none

360D-15.0.002
FLIGHT CREW SCHEDULE GENERATION PROGRAM

AUTHORS: E. Wrathall T. L. Croswell

DIRECT TECHNICAL INQUIRIES TO:
E. Wrathall
IBM Corporation
112 East Post Road
White Plains, New York 10601

*** N - FCSG1 15.1 22.2 - - - - - ***

DESCRIPTION - This program generates feasible flight schedules for airline crews, based on rules governing duty time, away time, etc. The output from this program is used to formulate an integer linear program which will pick the best feasible set of schedules from those generated by this program.

PROGRAMMING SYSTEMS - The program is written in PL/I; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Any System/360 which supports the Operating System.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D150002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.0.004
AUTOMATED LAYOUT DESIGN PROGRAM FOR OS/360

AUTHOR: W. O. Evans

DIRECT TECHNICAL INQUIRIES TO:
W. O. Evans
IBM Corporation
Highway 52 and N.W. 37 St.
Rochester, Minnesota 55901

*** N - - - - - - - - - ***

DESCRIPTION - The Automated Layout Design Program (ALDEP/360) is a program that creates block layouts of a new building. The program optimizes department location in a building based on interdepartmental nearness preferences.

The program required input in the form of an inter-departmental relationship table and department area requirements. Many block layouts are created and the better layouts are selected. The output consists of a matrix printout representing the better layouts.

PROGRAMMING SYSTEMS - Written in OS/360 FORTRAN and Basic Assembler Language, and operates under control of OS/360.

MINIMUM SYSTEM REQUIREMENTS - Compilation and execution requires at least a S/360 Model 40, minimum core - 128K bytes. Standard Instruction Set and Floating-Point option are required. At least one direct-access device for intermediate storage. OS/360 with PCP, MFT, or MVT is required. FORTRAN G and Assembler F are required for source deck compilation.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D150004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.1.001
UNIVERSITY ADMINISTRATORS DECISION LABORATORY

AUTHOR: W. W. Klaproth

DIRECT TECHNICAL INQUIRIES TO:
W. W. Klaproth
IBM Corporation
1130 So. Sixth Street
Springfield, Illinois

*** N - - 15.5 30.2 - - - - - ***

DESCRIPTION - The University Administrators Decision Laboratory applies the techniques of gaming simulation and the decision process to university administration. Participants are grouped in from two to nine teams and act as university executives making periodic high level decisions for their schools. The decisions involve the allocation of funds within a university to meet objectivity. A computer simulates the activity of each university and prepares reports showing the results and the decisions.

PROGRAMMING SYSTEMS - The math model was programmed in 360 COBOL E.

MINIMUM SYSTEM REQUIREMENTS - A 32K processor is required with DOS or TOS. Use under FOS requires a 64K machine.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D151001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.1.002
PURDUE SUPERMARKET MANAGEMENT GAME

AUTHOR: Franklin Mills

DIRECT TECHNICAL INQUIRIES TO:
Franklin Mills
IBM Corporation
100 South Wacker Drive
Chicago, Illinois 60606

*** N - - 15.2 29.0 30.0 15.5 - - - ***

DESCRIPTION - A mathematical model of a business economy has been designed, within which two to five supermarkets compete for their share of the market. The System/360, under control of the program, then simulates the business activity during the week in accordance with the rules of the model and prepares a series of reports showing the results of the weeks activity.

PROGRAMMING SYSTEMS - The program has been written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - A System/360 64K Model 30 and up with Decimal Arithmetic and Floating Point.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D151002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-15.1.003
INVENTORY MANAGEMENT SIMULATOR

AUTHOR: R. T. Lilly

DIRECT TECHNICAL INQUIRIES TO:
R. T. Lilly
Manufacturing Management Sciences
P. O. Box 345
Westborough, Massachusetts 01581

*** N - - 25.0 30.0 15.7 - - - - ***

DESCRIPTION - An inventory simulation program which provides at execution time-

- Four model options, constant, trend, seasonal and seasonal with trend.

CONTINUED FROM PRIOR PAGE

- Four order quantity options.
- Safety stock based on the percentage of service desired.
- Option of fast smoothing.
- Option of back-orders.
- Implied parameters.

Control cards are necessary only if altering parameters during execution.

PROGRAMMING SYSTEMS - The program is written in DOS COBOL.

MINIMUM SYSTEM REQUIREMENTS - A System/360 Model 30 with 32K, a card reader and a printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D151003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-15.1.004 *M
360 GASP III - GENERALIZED ACADEMIC SIMULATION PROGRAM

AUTHOR: J. Linderman R. E. Holz

DIRECT TECHNICAL INQUIRIES TO:
J. L. Linderman
Massachusetts Institute of Technology
77 Massachusetts Avenue
Cambridge, Massachusetts 02139

*** S MI - - - - - - - - ***

DESCRIPTION - 360 GASP III is a system for educational scheduling (timetable construction, resource allocation, sectioning, examination scheduling, simulation and planning). This version, designed with modern institutions in mind, is able to cope with modular scheduling, team teaching, ability tracking, individual studies, etc. In contrast to many data processing algorithms, GASP is basically Heuristic, seeking a "satisfactory" solution rather than an "optimal" one. The approach has proven both operationally and economically feasible. Man-machine interaction is required and the system is a successful and powerful "tool" when used properly as such. Savings in administrative time and effort have been reported as high as 75 per cent. More detailed information about the area and method of application is available in the write-up. The transmittal tape includes a load library, program source and object, and sample data. 360 GASP III is similar to 7090/94 GASP III (MI GASP SDA NO. 3455) in documentation and effect.

PROGRAMMING SYSTEMS - Utilizes the System/360 Operating System.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 128K core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D151004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-15.1.005
SIMULATION, EVALUATION AND ANALYSIS LANGUAGE (SEAL)

AUTHOR: D. M. Braddock C. B. Dowling

DIRECT TECHNICAL INQUIRIES TO:
D. M. Braddock
IBM Corporation
Bldg. 706
P. O. Box 390
Poughkeepsie, New York 12602

*** N - - 03.2 10.0 15.5 - - - - ***

DESCRIPTION - This program comprises a compiler and execution time package to operate under OS/360 using 215K bytes of storage exclusive of OS/360 requirements. "SEAL" is a high level discrete digital simulation language which includes the analytical capability of FORTRAN IV and a report generator. The language provides services such

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as time accounting, dynamic core allocation, list manipulation, dimension-free structured arrays, and operations on character strings, bit strings, integer, real, complex and logical variables. "SEAL" includes its own diagnostics, dump, trace and model maintenance facilities.

PROGRAMMING SYSTEMS - "SEAL" Assembly Language and a few FORTRAN routines.

MINIMUM SYSTEM REQUIREMENTS - 215K bytes of core storage exclusive of OS/360 requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D151005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
OPTIONAL	none	none		none

360D-15.1.006 *M
DISCOUNTED CASH FLOW ECONOMIC EVALUATION

AUTHOR: W. O. Harris

DIRECT TECHNICAL INQUIRIES TO:
W. R. Harris
W. R. Grace & Co.
Washington Research Center
Clarksville, Maryland 21029

*** C 1097 - 19.0 19.1 - - - - - ***

DESCRIPTION - This program provides a means, through the application of the present value concept, of generating the financial information required to evaluate the economic worth of potential business investments. Instantaneous discounting is employed to obtain the expected present value and effective interest rate of return. Present value and payout time may be determined for each of three specified discount rates, and thus a sensitivity analysis showing the effect of discount rate can be generated. Output is complete in regard to all input assumptions, annual profit and loss statements, non-discounted and discounted cash flows. Projects having anticipated cash flows from 1 to 20 years can be evaluated.

PROGRAMMING SYSTEMS - Source - DOS FORTRAN IV. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - 32K S/360-30 with two disk drives, a 1442 Card Reader/Punch, and a 1443 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D151006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.1.007
BLOCKED RECORD PROCESSING BY GPSS/360/OS

AUTHOR: S. W. Harrold

DIRECT TECHNICAL INQUIRIES TO:
S. W. Harrold
Sun Life Assurance Company of Canada
P.O. Box 6075
Montreal 101, Quebec, Canada

*** N - - 03.0 06.8 - - - - - ***

DESCRIPTION - The General Purpose System for operation under Operating System/360 requires a fair number of intermediate work files especially during the assembly and input phases of processing. In addition, if the JOBTAPE and/or READ/SAVE feature of GPSS/360 is used, there could be a heavy load of I/O operations during the actual simulation of the model itself. All input/output performed by the IBM distributed copy of GPSS/360 (360A-CS-17X) uses unblocked records only (Version 1 Level 2) thus failing to make full use of Operating System/360 data management services.

The author's modification to GPSS/360/OS allows records to be blocked on all files including card input and printer destined output. This greatly improves I/O performance and reduces overall simulation time; especially desirable

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for long running complex models. In addition, should a permanent I/O error occur, a formatted message is placed in core before concerning the error.

This module replaces the DAGC1 load module of the GPSS/360 program which means that the IBM supplied GPSS modules must already be present in the library before the modification is link edited.

PROGRAMMING SYSTEMS - Written in Assembler F with QSAM.

MINIMUM SYSTEM REQUIREMENTS - Operating System/360 capable of handling the version of GPSS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D151007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.001
DIRECT SEARCH ZERO-ONE INTEGER PROGRAMMING

AUTHORS: K. Spielberg C. E. Lemke

DIRECT TECHNICAL INQUIRIES TO:
K. Spielberg
IBM Corp.
590 Madison Ave.
New York. New York 10022

*** N - - - - - - - - - ***

DESCRIPTION - The program uses a direct tree search developed by the authors. Preliminary results indicate that the method used is considerably faster, perhaps by a factor of 2 to 4, than the additive algorithm of E. BALAS. A 35 variable, 28 constraint, test problem has been solved optimally in 4 minutes on the IBM 360 Model 40. The program should give at least suboptimal solutions for problems of 30 to 80 variables and a similar number of constraints.

PROGRAMMING SYSTEMS - The program is written in FORTRAN for the IBM 360 Model 40 and the size of the problems is limited by the restrictions imposed by the current version of the FORTRAN program. However, modifications for handling bigger problems can easily be made.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 40.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.002
TRANSPORTATION PROBLEM

AUTHOR: John S. Segal

DIRECT TECHNICAL INQUIRIES TO:
John S. Segal
IBM Corp.
222 Mamaroneck Avenue
White Plains, N.Y. 10601

*** N - - 27.4 15.5 - - - - - ***

DESCRIPTION - This problem solves the warehouse-distributor type of transportation problem using a column minima to generate an initial feasible solution. Column or row slack necessitated by inequality of availability and requirements is automatically generated.

PROGRAMMING SYSTEMS - Utilizes DOS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Any/360 with at least 32K core. Actual core required depends on problem size.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152002

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.005
BRANCH AND BOUND MIXED INTEGER PROGRAMMING - BBMIP

AUTHOR: R. Shareshian

DIRECT TECHNICAL INQUIRIES TO:
R. Shareshian
IBM Corp.
New York Scientific Center
590 Madison Ave.
New York, N. Y. 10022

*** N - - 13.0 - - - - - - ***

DESCRIPTION - The program employs a branch and bound algorithm based upon the LAND and DOIG method to solve mixed integer programming problems of limited size. However, the program may also be used to solve pure integer problems. The linear programming minimization problem is first solved without regard to integrality constraints. From this point the program proceeds as if to enumerate the set of all possible mixed integer solutions by constraining each integer variable singly and in turn to an integer value within its range. A dual simplex LP algorithm is used as a bound-establishing mechanism immediately after each integer variable is constrained. Large subsets of possible solutions, corresponding to continuations of partial sequences of integer-constrained integer variables, may be eliminated from consideration once it has been demonstrated that they must be inferior to the "best" feasible solution obtained to that point. When the total set has been exhausted, the best feasible solution is optimal.

PROGRAMMING SYSTEMS - The program is written in the FORTRAN IV language for the IBM/360 under the BPS system. Problem size is limited by the amount of core memory available. The LP routine is single precision.

MINIMUM SYSTEM REQUIREMENTS - An IBM System/360 under the BPS system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.006
SYSTEM/360 FORTRAN LINEAR PROGRAMMING SYSTEM

AUTHOR: L. E. G. Parker

DIRECT TECHNICAL INQUIRIES TO:
L. E. G. Parker
IBM Corp.
600 Eglinton Ave., East
Toronto 12, Ontario, Canada

*** N - - - - - - - - - ***

DESCRIPTION - This program solves linear programming problems using the "contracted tableau" form of the simplex method. Input to the program is in standard SHARE format (title card, rowid section, matrix section, and first B section).

The problem is solved in core, and the output includes an iteration log, optimal solution and cost range report, and reduced costs of slack variables and structural variables not in the optimal solution.

The program, as distributed, can solve a problem of size MxN up to 40x40 (where M equals number of rows, N equals number of structural columns plus number of rows), on a 32K or larger System/360 under BPS, DOS, TOS or OS FORTRAN. Sample running time for problems of size 25x25 is of the order of 1 minute on a Model 30.

PROGRAMMING SYSTEMS - This program is written entirely in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 30 with at least 32K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

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ORDERING INFORMATION: PROGRAM NUMBER 360D152006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.007
MFOR 360 LINEAR PROGRAMMING CODE

AUTHOR: J. Shwimer

DIRECT TECHNICAL INQUIRIES TO:
J. Walters, Jr.
Massachusetts Institute of Technology
Department of Economics, E52-274B
Cambridge, Mass. 02139

*** S - - - - - - - - - ***

DESCRIPTION - MFOR 360 is an independent routine which uses the revised simplex method with the product form of the inverse to solve the linear programming problem in standard form. MFOR 360 has been compiled and tested using OS Version 11 on a S/360 Model 65.

The routine is an all-in-core routine, therefore no secondary storage is needed. Symbolic control cards direct the operation of MFOR 360.

PROGRAMMING SYSTEMS - Written in FORTRAN IV (G Level) with one subroutine in 360 Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Those needed to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.009 *M
LARGE SCALE TRANSPORTATION PROBLEM

AUTHOR: John S. Segal

DIRECT TECHNICAL INQUIRIES TO:
John S. Segal
222 Mamaroneck Ave.
White Plains, New York 10601

*** N - - 23.0 - - - - - - ***

DESCRIPTION - This program, a modification of program 360D-15.2.002, solves the warehouse-distributor type of transportation problem by the MOD 1 method using row minima to generate an initial feasible solution. Column or row slack necessitated by inequality of availability and requirements is automatically generated.

PROGRAMMING SYSTEMS - Programming language - FORTRAN. Operating system required - OS or DOS.

MINIMUM SYSTEM REQUIREMENTS - Any (360 with at least 32K core and one bulk storage unit (tape or disk). Actual core required depends on problem size.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.010
FORTRAN TRANSPORTATION CODE

AUTHOR: B. C. Kahan

DIRECT TECHNICAL INQUIRIES TO:
B. C. Kahan
Fields Systems Centre
IBM United Kingdom Limited
101 Wigmore Street, London, W.1.

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DESCRIPTION - This program solves the classical transportation problem for all S/360 computers possessing a FORTRAN compiler which handles the logical intruction set, by a stepping stone algorithm using cross-reference tables contained in core. To obviate rounding errors, integer arithmetic is used throughout optimization, but when checkpoints are taken, a floating point record of hash costs indicates that optimization is under control. The program handles all cases of unbalanced resources and requirements and will at programmer option perform partial optimization when resources are insufficient. Only feasible routes through the costs matrix are examined to ensure efficient execution of sparsely active systems. Output includes sorted assignments together with exception reports for management. Checkpoints are taken automatically at the beginning and end of the program and at intermediate points at the user's option, with a simple restart procedure.

PROGRAMMING SYSTEMS - Written in FORTRAN and utilizes OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40G with disk space for costs data and a tape drive for recording checkpoints.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-15.2.011
ZERO-ONE INTEGER PROGRAMMING WITH HEURISTICS

AUTHOR: B. D. Holcomb

DIRECT TECHNICAL INQUIRIES TO:
B. D. Holcomb
Union Carbide Corporation
Computer Technology Center
Post Office Box P
Oak Ridge, Tennessee 37830

*** S OR - - - - - - - - ***

DESCRIPTION - The Zero-One Integer Programming With Heuristics program is designed to solve linear programming problems whose variables are restricted to values of zero or one. The program utilizes the well known additive algorithm of Egon Balas conbined with a group of user selected Heuristic test options designed to speed solution time by taking advantage of individual problem characteristics.

PROGRAMMING SYSTEMS - The program deck consists of a main program and four subroutines written in FORTRAN plus a three card object deck of a clock reading function.

MINIMUM SYSTEM REQUIREMENTS - The program has been tested on the IBM 360 Model 50 using OS/360. However, the use of any IBM 360 Model 40 or larger with OS/360 should not cause difficulties.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.2.013 *N
SYSTEM/360 COMPUTER ASSISTED MENU PLANNING

AUTHOR: J.L. Balintfy

DIRECT TECHNICAL INQUIRIES TO:
J.L. Balintfy, Director of Eng.
Graduate School of Business Administration
Tulane University
New Orleans, La. 70118

*** N CAMP3 - 99.0 - - - - - - ***

DESCRIPTION - CAMP is an integrated food management

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information and menu planning FORTRAN program package to operate as a self-contained man-machine system under DOS. The Introduction describes the machine configuration, disk file organization and general operating procedures. Part A contains four data processing program packages with instructions for collecting, organizing and storing the user's food, nutrient and recipe data on disk files. A generous amount of sample data including the whole nutrient composition table of USDA Handbook 8 and 100 recipes are attached to facilitate applications. Part B contains four-on-line data retrieval programs designed to introduce historically the first accurate food cost, food quantity and nutrient accounting control procedures by computer for volume feeding organizations. Part C is a set of programs based on the most advanced mathematical principles to optimize the decision process of planning selective or nonselective diets balanced exactly for desired levels of palatibility and nutrition at minimum cost. All the programs are built in modular fashion such that connections between them and other peripheral systems can be easily established by the user.

PROGRAMMING SYSTEMS - Written in FORTRAN and operates under DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 25 with 32K core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D152013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC		DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-15.3.001
NON LINEAR OPTIMIZATION - RICOCHET GRADIENT METHOD

AUTHORS: J. Greenstadt R. T. Mertz

DIRECT TECHNICAL INQUIRIES TO:
J. Greenstadt
IBM Corp.
New York Scientific Center
590 Madison Ave.
New York, N. Y. 10022

*** N - - - - - - - - - ***

DESCRIPTION - To find the constrained maximum of a function, the program begins at a feasible point and follows the objective function gradiant until a constraint is reached. The program "ricochets" and traverses on the objective surface across the feasibility region to the opposite constraint. These two constraints and the traverse line are assumed to form a triangle. The program then begins a new gradient search from the traversal point immediately beneath the apex of this triangle. The method terminates either on a small step-size or when no ricochet is possible.

PROGRAMMING SYSTEMS - Written for IBM S/360 in FORTRAN G-Level source language.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 50 and uses 1 card reader for input, 1 printer for output, and 109,784 bytes of storage for program and data (excluding supervisor and I/O); no scratch tape or other intermediate I/O is used.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D153001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-15.3.002 *N
QPS: A QUADRATIC PROGRAMMING SYSTEM FOR THE

AUTHOR: R. Karash

DIRECT TECHNICAL INQUIRIES TO:
R. Karash
97 Highland Ave.
Watertown, Massachusetts 02172

360D

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*** S MCE - - - - - - - - - ***

DESCRIPTION - The QPS system minimizes a quadratic objective subject to a set of linear inequality constraints. The objective may be any second order polynomial, i.e.

$$px + x'Qx$$

where p and x are vectors and Q is a symmetric matrix.

Symbolic control cards guide the input of data, set parameters and select to our various output options. The Code is written in single precision FORTRAN IV and all data are maintained in core. The maximum problem size depends upon the main storage available.

A parametric feature minimizes

$$Lpx + x'Qx$$

(where L is a scalar) over a range of L values.

The method employed is essentially as described by G.B. Dantzig in Linear Programming and Extensions, Princeton 1963, section 24-4, pp.496-7. The QPS system is a modification of program RS QPF4, SHARE #3326, by Ieola Cutler of Rand Corporation.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - A minimum of 128K storage and those required to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D153002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.4.001
CPM PERT TIME

AUTHOR: D. G. Douglas, Jr.

DIRECT TECHNICAL INQUIRIES TO:
D. G. Douglas, Jr.
IBM Corp.
570 Broad St.
Newark, N. J. 07102

*** N - - 23.1 10.1 - - - - - ***

DESCRIPTION - This program performs standard network time calculations and produces a dated predecessor-successor schedule. On a 65K System/360, the capacity is 1100 activities. The design and implementation is similar to NASA PERT TIME I; however probabilities are not calculated and sorted reports are not produced. An output tape and/or cards are produced for further processing if additional reports are required.

PROGRAMMING SYSTEMS - The program is written entirely in BOS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Requires a 65K System/360 with 3 tape drives. The program can be modified to handle more activities with more core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D154001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.4.002
CRITICAL PATH AND MANPOWER LEVELING SYSTEM

AUTHOR: John S. Segal

DIRECT TECHNICAL INQUIRIES TO:
John S. Segal
IBM Corp.
222 Mamaroneck Avenue
White Plains, N.Y. 10601

*** N - - 13.4 - - - - - - ***

DESCRIPTION - This system accepts card input containing I, J, D, manpower required by up to 10 crafts, and description for up to 2,000 jobs, and computes early start, early finish, late start, and finish time for all jobs. In addition, if desired, it will go through another pass and compute start times, within the critical path, to give

CONTINUED FROM PRIOR PAGE

the most even manpower usage possible.

PROGRAMMING SYSTEMS - The programming language is DOS FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Requires 65K/360 with two disks and a printer with 132 print positions.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D154002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.4.004
ICES/360 PROJECT-I

AUTHOR: Civil Engng. Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
Civil Engng. Systems Lab.
Massachusetts Inst. of Tech.
Dept. of Civil Engineering
Cambridge, Mass. 02139

*** S MCE PROJI 16.2 20.3 06.7 - - - - ***

DESCRIPTION - PROJECT-I is an ICES/360 subsystem for assisting in project planning and control in two major areas- (1) scheduling via network and extra-network representation and (2) information handling for cost and resource projections for cost and progress reporting.

ICES/360 PROJECT-I may be used for scheduling a series of independent projects comprised of inter-connected unit tasks. Provisions are made for retaining the current status of projects at all times, eliminating the need to re-input and reflow networks each time the project is operated upon. capabilities of adding, changing, and deleting input data are provided to reflect changing ideas on project models as project progress continues. Also included is the capability of "LAG" factors on activity-on-node representation which allow the use of the time dimension for precedence arcs of the network. Detailed schedules and reports are available along with the feature of selectively displaying data for subsets of project data.

PROGRAMMING SYSTEMS - ICES/360 PROJECT-I is programmed in ICES/360 ICETRAN and ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with two 2311 Disk Drives (or their equivalent), and input-output devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D154004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/1600	29	none
		DTR 9/800	28	none
OPTIONAL	none	none		none

360D-15.4.005
A GANTT REPORT FOR MASTER PLANNING

AUTHOR: J. F. Kray

DIRECT TECHNICAL INQUIRIES TO:
J. F. Kray
IBM Corporation
Dept. 188, P.O. Box 6
Endicott, New York

*** N - - 03.5 20.3 - 23.1 - - - ***

DESCRIPTION - This program produces a Gantt chart for master planning. Such charts are a very useful aid to effective scheduling and control of various aspects of production. Important events in the production cycle (such as critical deadline dates) are set off graphically on a time scale. The report produced by this program allows the user to look 15 weeks ahead of the current date. Options are provided to shift the time scale 1, 2, 3, or 4 weeks to the left. Thus, the report may be updated frequently with a minimum of keypunching new data.

PROGRAMMING SYSTEMS - Programming language - PL/I. Operating system required - S/360 Operating System (OS).

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MINIMUM SYSTEM REQUIREMENTS - System/360, Model 30 or larger without modification. It is possible to modify the program so that it will run on smaller models of the System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D154005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-15.4.006
ICES/360 SOURCE PROJECT - I

AUTHORS: R. L. Daniels B. Bayer
P. Alfroid

DIRECT TECHNICAL INQUIRIES TO:
R. L. Daniels
Civil Engineering Systems Laboratory
Department of Civil Engineering
Massachusetts Institute of Technolcgy
Cambridge, Mass. 02139

*** S MCE PROJ I 16.2 20.3 06.7 - - - ***

DESCRIPTION - Project-I is an ICES/360 subsystem for assisting in project planning and control in two major areas: (1) scheduling via network and extra-network representation and (2) information handling for cost and resource projections and for cost and progress reporting. ICES/360 Project-I may be used for scheduling a series of independent projects comprised of inter-connected unit tasks. Provisions are made for retaining the current status cf projects at all times, eliminating the need to re-input and re-flow networks each time the project is operated upon. Capabilities of adding, changing, and deleting input data are provided to reflect changing ideas on project models as project progress continues. Also included is the capability of "lag" factors cn activity-on-node representation which allow the use of the time dimension for precedence of the network. Detailed schedules and reports are available along with the feature of selectively displaying data for subsets of project data.

ICES-Project-I is composed of two distribution packages. These are (a) the object package - ICES/360 Project-I (360D 15.4.004) and (b) this package, the source package - ICES/360 Source Project-I composed of all source material for ICES Project-I (with documentation).

PROGRAMMING SYSTEMS - ICES/360 Project-I is programmed in ICES/360 ICETRAN and ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360 Versions 9 through 14 on S/360 Models 40, 50, 65, and 75.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 40, 128K with two 2311 Disk Drives (or their equivalent), and input and output devices. If OS/360 resides on more than one 2311, then the Project requirements for direct access storage devices are increased correspondingly.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D154006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-15.5.001 *M
SYSTEM/360 MANAGEMENT DECISION MAKING EXERCISE

AUTHORS: T. G. Kaplits W. R. Hallett
S. J. Krasnow

DIRECT TECHNICAL INQUIRIES TO:
W. R. Hallett
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2925 Euclid Avenue
Cleveland, Ohio 44115

*** N - - 15.1 30.2 - - - - - ***

DESCRIPTION - The System/360 Management Game Program, an exercise modeled after the business strategy game constructed for the American Management Association, permits

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five teams or companies to compete in an economic market. Each team has control over a number of decision variables which determine its success or failure in competing with each other. The results from one decision enable each team to make further decisions for the next period; each period is a quarter of a year. Every fourth quarter, annual statements are produced for each team.

PROGRAMMING SYSTEMS - The game, consisting of two FORTRAN programs and one Assembler program, permits the operator to vary parameters to control the economic market for each quarter.

MINIMUM SYSTEM REQUIREMENTS - System/360 Management Game was designed to run under 16K DOS on a system with a minimum of 32K of core, Decimal and Floating Point Arithmetic, two tapes, a card reader or tape, one-2311 with room for one data file, a console typewriter and printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D155001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	DTR 9/1600	29	none
		DTR 9/800	28	none
		MT 7DC/800	26	01

360D-15.5.002
HOSPITAL ADMINISTRATION DECISION MAKING LABORATORY

AUTHOR: S. B. Lucas

DIRECT TECHNICAL INQUIRIES TO:
S. B. Lucas
IBM Corp.
112 E. Post Rd.
White Plains, N.Y. 10601

*** N - - 15.1 30.2 - - - - - ***

DESCRIPTION - This program provides a computerized mathematical model as the basis of a management game oriented to hospital administration. While general management games or decision making laboratories are applicable to many industries, the medical hospital industry has significant operational differences. The hospitals service and nonprofit characteristics require different decision criteria and success evaluation factors.

PROGRAMMING SYSTEMS - Written in FORTRAN IV and requires DOS/360.

MINIMUM SYSTEM REQUIREMENTS - The program requires a 64K System/360 with the Scientific Instruction Set, and is operational under the Disk Operating System.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D155002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.5.003 *N
QUAKER OATS VERSION OF PURDUE SUPERMARKET MANAGEMENT GAME

AUTHOR: J. Lacher

DIRECT TECHNICAL INQUIRIES TO:
J. Lacher
Manager, Customer Programs Dept.
The Quaker Oats Company
Merchandise Mart Plaza
Chicago, Illinois 60654

*** N - - - - - - - - - ***

DESCRIPTION - This program is a modification of the Purdue Supermarket Management Game which has been available as Program Number 360D-15.1.002. These changes adjust the weight of factors in the model to approach a more realistic supermarket management environment and to allow for trends that have occurred in the food distribution industry since the original program was written. The game simulates weekly business activity of two to five supermarkets which

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compete with one another in one area of a large city. Manuals for participants of the game are available from the Customer Programs Department, Quaker Oats Company.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - An IBM 360 Model 30 or larger, 64K of storage, Floating Point and Decimal Arithmetic. A printer, card reader, one 9-track tape drive and two 2311 Disk Drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D155003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-15.6.001
A SIMPLE PLANT LOCATION PROGRAM 1 - SPLT 1

AUTHOR: K. Spielberg

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
N. Y. Scientific Center
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New York, N.Y. 10022

*** N - SPLT1 15.2 - - - - - - ***

DESCRIPTION - The program solves the problem of deciding which of M proposed plants should be operating (or built) such that N given customer demands are satisfied at minimal operating and shipping cost. The operating cost association with plant I is assumed to be a fixed charge F (I) only. The input input data can be constructed such that (for plant I) a linear cost function with intercept F(I) can also be accommodated. The plants are assumed to have sufficient capacity to meet required demands.

The algorithm employed combines features of the mixed integer algorithm of land and DOIG (as advocated by M.A. Efroymson and T.L. Ray) and that proposed by C.E. Lemke and the author. It should allow the solution, within reasonable times, of problems with about 50-100 plants and 100 customers. In the case of larger problems, the user may have to be satisfied with suboptimal solutions.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model 40.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D156001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-15.6.002
PLANNING SYSTEMS GENERATOR

AUTHORS: H. F. Lande C. E. Fullerton
C. C. Tsao R. M. Belsky
R. J. Lipsky

DIRECT TECHNICAL INQUIRIES TO:
L. H. Lande
IBM Corporation
Dept. 675
Armonk, New York 10504

*** N - - 03.0 03.4 03.5 03.7 - - - ***

DESCRIPTION - Planning Systems Generator (PSG) is a unique, prepackage computer dialect tailored to the needs of the financial analyst or planner who wishes to make use of a computer in calculating, accumulating and analyzing plans and printing the results in a variety of conventional reports ready for use with management. The PSG user designs his reports via print specifications which consist of English descriptions, format codes and data locations. In specifying his planning logic the PSG user may call on macro instructions or write his own FORTRAN control statements. These print and logic specification cards, plus data cards, complete the users programming effort.

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PSG controls I/O and all internal computer operations and executes the users program.

PROGRAMMING SYSTEMS - Programming language - FORTRAN IV; requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Mod. 40 or larger with 256K memory. Logical units 1, 2, 4, 5 and 6 are called on.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D156002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.0.001 *N
UCARDS: UNION CARBIDE AUTOMATIC ROUTINE AND DESIGN FOR PRINTED CIRCUIT BOARDS

AUTHOR: J. R. Jamison

DIRECT TECHNICAL INQUIRIES TO:
B. L. Crass
Union Carbide Corporation
Computing Technology Center
P.O. Box P
Oak Ridge, Tennessee 37830

*** S CR - 16.4 23.4 - - - - - ***

DESCRIPTION - The S/360 UCARDS program is an automated design system for producing component layout, conductor layout and other aids for the fabrication of printed circuit boards.

PROGRAMMING SYSTEMS - Written primarily in FORTRAN IV and is presently implemented on an IBM 360/50-65 intercoupled system.

MINIMUM SYSTEM REQUIREMENTS - All of the program was compiled and checked out using Version 15/16 and requires approximately 280,000 bytes of core storage, two 9-channel and two 7-channel tape drives. Of course, a card reader and printer are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D160001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.1.001
ROCKET - FORTRAN 4 VERSION

AUTHORS: E. Boehm J. Rieber
Miss P. Leonhardt

DIRECT TECHNICAL INQUIRIES TO:
Miss P. Leonhardt
The Rand Corp.
1700 Main St.
Santa Monica, Calif.

*** S RS RKT4 43.1 10.3 - - - - - ***

DESCRIPTION - ROCKET IV is a FORTRAN IV program which mathematically simulates the flight of aerospace vehicles by numerical integration of their equations of motion. A special purpose input form enables the user to specify the characteristics of his vehicle and its flight plan, both of which can vary through a wide range of choices, with comparatively little effort.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - The program requires the use of a FORTRAN compiler, reads input from tape 5, and writes output on tape 6. It occupies about 25,000 words of core.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D161001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-16.2.001
TSOP/360 VEHICULAR TRAFFIC CONTROL - TRAFFIC SIGNAL OPTIMAL PROGRESSION (TIME-SPACE OFFSET)

AUTHOR: Arie Yardeni

DIRECT TECHNICAL INQUIRIES TO:
Arie Yardeni
IBM Corp.
1000 Westchester Ave.
White Plains, N.Y. 10604

*** N - - 15.2 - - - - - ***

DESCRIPTION - This program describes the basic concepts and operation and the input and output features employed in a computer program, which provides the traffic engineer with a tool for either the off-line design of traffic signal progressions for fixed-time control, or the on-line computation of control variables for real-time computer signal control. Weighted least-squares fit models or min-max deviations algorithms can be selected to derive linear uni-speed through bands for given volume requirements and within given limits of speeds and cycle times. Alternative algorithms for offset computation with three-phase design capability are also included in the program.

PROGRAMMING SYSTEMS - The program is written in FORTRAN IID for IBM 1620-40K with IBM 1311 Disk Monitor Processing, in FORTRAN IV for IBM 7040/90 IBSYS Monitor Processing, in FORTRAN E for the IBM System/360 and in IBM 1130 FORTRAN for the IBM 1130 Disk Monitor System.

MINIMUM SYSTEM REQUIREMENTS - For the 1620, the minimum system requirements are the same as for the 1620-40K with IBM 1311 Disk Monitor Processing. For the 1040/90 the minimum system requirements are the same as for the 7040/90 IBSYS Monitor Processing. For the System 1130, the minimum system requirements are the same as for the IBM 1130 Disk Monitor System.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.2.002
COGO - MODIFIED FOR DOS/360

AUTHOR: D. Oshea

DIRECT TECHNICAL INQUIRIES TO:
D. Oshea
IBM Corp.
1399 Franklin Ave.
Garden City, N.Y. 11530

*** N - - - - - - - - - ***

DESCRIPTION - This program is based upon the Type II 1130 COGO Program, (Version 1 - Modification Level 1) converted to System/360 DOS. Differences between 1130 and S/360 COGO -

- Short form command names may be used for input.
- Output formats have been improved.
- Coordinate table has been increased to 9,999 points.
- Up to 50 curves can be stored on disk and referenced instead of just the most recently computed curve.
- Output formatting curves have been included.
- Additional commands and alternates to existing commands have been included.
- Plotting commands have been developed.

PROGRAMMING SYSTEMS - DOS - Maximum supervisor of 8K; program is in FORTRAN with the exception of one Assembly Language routine which acts as an overlay supervisor.

MINIMUM SYSTEM REQUIREMENTS - S/360 Mod 30 with 32K core storage, 1-2311 Disk Drive, a card reader and a printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.

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MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360D162002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-16.2.003
DOS/360 CIVIL ENGINEERING COORDINATE GEOMETRY (COGO)

AUTHORS: P. S. Rhode R. E. Hoff

DIRECT TECHNICAL INQUIRIES TO:
P. S. Rhode
IBM Corp.
690 N. Robert St.
Saint Paul, Minn. 55101

*** N - - - - - - - - - ***

DESCRIPTION - DOS/360 Civil Engineering Coordinate Geometry (COGO) is a direct conversion from COGO for the IBM 1130.

PROGRAMMING SYSTEMS - Written in FORTRAN and Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - In addition to the requirements for DOS FORTRAN, a 32K S/360 (with a 6K or 8K DOS Supervisor) and 2 cylinders on a 2311 Disk Pack.

See program abstract 1130-EC-02X for description of COGO.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.2.005
ICES/360 BASIC SYSTEM AND LANGUAGE PROCESSORS

AUTHOR: Civil Engineering Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Laboratory
Massachusetts Institute of Technology
Department of Civil Engineering
Cambridge, Mass. 02139

*** S MCE ICESC 05.0 03.0 06.7 - - - - ***

DESCRIPTION - ICES/360 (Integrated Civil Engineering System) for the IBM System/360 is a computer system offering general problem solving capabilities in the area of Civil Engineering.

The goal of ICES is to allow each organization to generate and use a system that best satisfies its problem solving needs and computer configuration. Therefore, ICES/360 is distributed in several parts.

ICES incorporates a number of engineering subsystems where each subsystem offers problem solving capabilities in a different area of engineering. Examples of two ICES subsystems are COGO, used for geometric problem solving, and STRUDL, used for structural analysis and design. Each subsystem is distributed independently of the other subsystems, so that organizations can obtain those subsystems it wishes to use without obtaining the other subsystems.

PROGRAMMING SYSTEMS - ICES operates as a normal job under OS/360 and has been generated and tested using OS/360 Versions 5 through 15/16. ICES has been successfully operated using PCP, MFT (option 2), ASP and HASP.

MINIMUM SYSTEM REQUIREMENTS - System/360 with 128K, two 2311 Disk Drives (or their equivalent) and input and output devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162005

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.006 *N
ICES/360 COGO I

AUTHOR: Civil Engineering Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
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Cambridge, Mass. 02139

*** S MCE COGOI 06.7 - - - - - - ***

DESCRIPTION - COGO is an ICES/360 subsystem for the solution of civil engineering geometrics problems. It consists of commands, processing routines, and information files. COGO is programmed in ICES/360 ICETRAN and in ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360 Versions through 12 on S/360 Models 40, 50, 65, and 75. COGO can be used to solve geometric problems in engineering which entail manipulating such objects as points, lines, circular, spiral, and parabolic curves, alignments, traverses, profiles, and general chain-like objects. Its commands are natural-language statements of civil engineering geometrics and provide for extreme flexibility in use and powerful problem-solving capabilities. The COGO System is provided as a set of load modules which can be copied into a data set on direct-access storage.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and input and output devices. If OS/360 resides on more than 1-2311, then the COGO requirements for direct-access storage devices is increased correspondingly. A COGO problem runs as a normal job under PCP of OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.007
ICES/360 STRUDL-I

AUTHOR: Civil Engineering Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE STRDI 16.1 16.8 06.7 - - - - ***

DESCRIPTION - ICES/360 STRUDL-I is an ICES/360 subsystem for the solution of structural engineering problems. It consists of commands and processing routines. STRUDL is programmed in ICES/360 ICETRAN and in ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360 Versions 5 through 12 on S/360 Models 40, 50, 65, and 75. ICES/360 STRUDL-I may be used to perform preliminary and exact analyses of two or three dimensional framed structures of parts of structures. Members and joints may be rigidly connected or pinned. Data may be stored, modified in any way, retrieved, and subsetted. Detailed output useful for performing and checking designs may be requested, all using natural-language engineering commands.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and input and output devices. If OS/360 resides on more than one 2311, the the STRUDL requirements for direct access storage devices is increased correspondingly.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162007

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.008
ICES/360 TABLE-I

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE TABLI 06.4 01.6 - - - - - - ***

DESCRIPTION - ICES/360 Table-I is an ICES/360 subsystem for creating, editing, and subsetting files of tabular information. ICES/360 Table-I may be used to store real data in rectangular tables with rows and columns identified by arbitrary symbolic variables. Table data may be used in any ICES subsystem, retrieved symbolically through a series of functions. Special sequences based on data in a table may be established and used with retrieval functions to sequence trial designs. Tables of section properties may be created for use with the STRUDL subsystem. ICES/360 Table-I is one of several engineering subsystems which were developed as part of the ICES/360 system. To operate any of these subsystems an organization requires certain basic ICES programs which are not included as a part of ICES/360 Table-I. Therefore, in addition to this distribution, an installation must also order either distribution 360D-16.2.004, ICES/360 Basic System, or distribution 360D-16.2.005, ICES/360 Basic System and Language Processors.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and input and output devices. If OS/360 resides on more than one 2311, then the table requirements for direct access storage devices is increased correspondingly.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.009
ICES/360 SEPOL-I

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE SEPLI - - - - - - - - ***

DESCRIPTION - ICES/360 SEPOL-I is an ICES/360 subsystem for the calculation of stresses and strains in the soil due to shallow foundation loadings, and the magnitudes and progress of settlement of shallow foundations. ICES/360 SEPOL-I may be used to perform settlement calculations for the design of buildings, earth dams, highway enbankments and other foundations which cause spread loadings at or near the surface of the soil. Data describing the soil profile and surface loading may be stored. Soil properties, stress and strain distributions, magnitudes, and progress of settlement may be calculated and printed.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and in ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and input/output devices. If OS/360 resides on more than one 2311, the SEPOL requirements for direct access storage devices is increased correspondingly. ICES/360 SEPOL-I is one of several engineering subsystems which were developed as part of the ICES/360 system. To operate any of these subsystems an organization requires certain basic ICES programs which are not included as part of ICES/360 SEPOL-I. In addition to this distribution, an installation must also order either distribution 360D-16.2.004, ICES/360 Basic System, or distribution 360D-16.2.005, ICES/360 Basic

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System and Language Processors.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.010 *M
ICES/360 ROADS-I

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE ROADI - - - - - - - - ***

DESCRIPTION - ICES/360 Roads-I is an ICES/360 subsystem for the solution of problems in highway location and design. It consists of an engineering language and associated commands, processing routines, and information files. Roads can be used in the location and design of almost any type of roadway, including highways, waterways, railroads, and dykes. It is applicable after a general location corridor has been defined and can be used throughout the resulting design process. Major phases include a digital terrain model of both surface and subsurface materials; alignment and profile geometry integration with ICES/360 COGO; flexible roadway cross-section design and template changes under the control of engineering commands; and the simulation of individual vehicles to determine the effects of roadway geometry and traffic on vehicle performance. Information such as typical roadway cross-sections, the multi-material terrain model, and as-designed roadway cross-sections are stored directly on secondary storage. Provision is made for access to, and transfer from, the geometry routines and data tables of COGO. Roads is based on the concepts and experience of the Digital Terrain Model (DTM), COGO and Vehicle Simulation and Operating Cost Systems. ICES/360 Roads-I is provided as a set of load modules, command dictionaries, and data tables which can be copied into data sets on direct-access storage.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360, Model 40, 128K, 2-2311 Disk Drives (or their equivalent) and I/O devices such as a card reader, card punch, and printer. A magnetic tape unit is required to generate the system but is not required to run the system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.011
ICES/360 TRANSET-I

AUTHOR: Civil Engineering Systems Lab.

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*** S MCE TRNTI 15.1 06.7 - - - - - ***

DESCRIPTION - TRANSET is an ICES/360 subsystem for the solution of transportation network analysis problems. It consists of commands, processing routines, and information files. TRANSET includes traffic assignment and minimum path transportation capabilities as well as transportation information file generation, modification, storage, and retrieval capabilities. Its commands are natural-language statements of transportation planning analysis steps and provide for extreme flexibility in use and powerful problem-solving capabilities. The TRANSET

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system is provided as a set of load modules which can be copied into a data set on direct-access storage.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and in ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and a reader, punch, and printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.012
ICES/360 EDUCATIONAL COGO-I

AUTHOR: C. L. Miller

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Massachusetts Inst. of Tech.
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*** S MCE COGOE 30.2 - - - - - - ***

DESCRIPTION - COGO is an ICES/360 subsystem for the solution of civil engineering geometrics problems. This distribution contains a set of ICES COGO programs which can be used in the teaching and demonstration of ICES COGO I and the use of computers in engineering. It has been tested using ICES/360 COGO I. It requires OS/360 PCP, either ICES/360 Basic (360D-16.2.004) or ICES/360 Basic plus Language Processors (360D-16.2.005), and ICES/360 COGO I (360D-16.2.006).

PROGRAMMING SYSTEMS - Written in ICES COGO I Language.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and I/O devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.013
ICES/360 BRIDGE I DESIGN SYSTEM

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE BRIDI 06.7 - - - - - - ***

DESCRIPTION - ICES/360 Bridge-I Design System is an ICES/360 subsystem for the solution of specific bridge engineering problems. It consists of commands and processing routines. ICES/360 bridge-I design system may be used in the determination of preliminary span arrangements, or concrete deck design or analysis, or the preliminary design of a simple or continuous span bridge girder. The command structure allows the engineer to participate in and direct the problem solution of a bridge project. This is in much the same format and terminology that he would discuss with a colleague the design stages of a bridge project.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K with 2-2311 Disk Drives (or their equivalent) and I/O devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

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ORDERING INFORMATION: PROGRAM NUMBER 360D162013

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.014
ICES/360 SOURCE TABLE I

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE TABSI 01.6 06.4 - - - - - ***

DESCRIPTION - ICES/360 Table-I is an ICES/360 subsystem for creating, editing, and subsetting files of tabular information. ICES/360 Table-I may be used to store real data in rectangular tables with rows and columns identified by arbitrary symbolic variables. Table data may be used in any ICES subsystem, retrieved symbolically through a series of functions. Special sequences based on data in a table may be established and used with retrieval functions to sequence trial designs. Tables of section properties may be created for use with the STRUDL subsystem. If OS resides on more than one 2311, the table requirements for direct access storage devices are increased correspondingly.

ICES Table-I is composed of two distribution packages. These are the Object Package - ICES/360 Table-I (360D-16.2.008) and this package, the Source Package - ICES/360 Source Table-I. The former package is composed of data sets and object modules of ICES Table-I. The latter package is composed of all source material for ICES Table-I (with documentation). Source material is provided on tape in three files, consisting of card image blocked files of (1) Table-I Command Definition Language input for language definition, (2) Source programs for Table-I, in both ICETRAN and S/360 Assembler Languages, and (3) Input to SETGEN procedure for formation of Table-I Load Modules. This tape may be listed and/or punched onto cards.

The object package should be ordered by those installations which will make use of ICES/360 Table-I as distributed and do not wish to modify it. The source package should be ordered by those installations which wish to modify and update ICES/360 Table-I, or which wish an understanding of the internal operations of ICES/360 Table-I.

ICES/360 Table-I is one of several engineering subsystems which were developed as part of the ICES/360 system. To execute or modify an ICES subsystem such as ICES Table-I an organization requires certain basic ICES programs which are not included as part of either ICES Table-I distribution. Specifically, if the installation wishes to execute the Table Object Package (360D-16.2.008) without modifying ICES Table-I, an installation must order either distribution 360D-16.2.004, ICES/360 Basic System or distribution 360D-16.2.005, ICES/360 Basic System and Language Processors. On the other hand, if the installation wishes to modify the table object package, it requires this package, ICES/360 Source Table-I and distribution 360D-16.2.005, ICES/360 Basic System and Language Processors.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and I/O devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162014

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.015
ICES/360 SOURCE STRUDL-I

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE STRSI 06.7 16.1 16.8 - - - - ***

DESCRIPTION - ICES/360 STRUDL-I is an ICES/360 subsystem for the solution of structural engineering problems. It consists of commands and processing routines.

ICES/360 STRUDL-I may be used to perform preliminary and exact analyses of two or three dimensional framed structures or parts of structures. Members and joints may be rigidly connected or pinned. Data may be stored, modified in any way, retrieved, and subsetted. Detailed output useful for performing and checking designs may be requested, all using natural-language engineering commands. If OS/360 resides on more than one 2311, the STRUDL requirements for direct access storage devices are increased correspondingly.

ICES STRUDL-I is composed of two distribution packages. These are the Object Package - ICES/360 STRUDL-I (360D-16.2.007) and this package, the Source Package - ICES/360 Source STRUDL-I. The former package is composed of data sets and object modules of ICES STRUDL-I. The latter package is composed of all source material for ICES STRUDL-I (with documentation). Source material is provided on tape in three files, consisting of card image blocked files of (1) STRUDL-I Command Definition Language input for language definition, (2) Source programs for STRUDL-I in both ICETRAN and S/360 Assembler Languages, and (3) Input to SETGEN procedure for formation of STRUDL-I Load Modules. This tape may be listed and/or punched onto cards.

The object package should be ordered by those installations which will make use of ICES/360 STRUDL-I as distributed and do not wish to modify it. The source package should be ordered by those installations which wish to modify and update ICES/360 STRUDL-I or which wish an understanding of the internal operations of ICES/360 STRUDL-I.

ICES/360 STRUDL-I is one of several engineering subsystems which were developed as part of the ICES/360 system. To execute or modify an ices subsystem such as ICES STRUDL-I an organization requires certain basic ICES programs which are not included as part of either ICES STRUDL-I distribution. Specifically, if the installation wishes to execute the STRUDL Object Package (360D-16.2.007) without modifying ICES STRUDL-I, an installation must order either distribution 360D-16.2.004, ICES/360 Basic System or distribution 360D-16.2.005, ICES/360 Basic System and Language Processors. On the other hand, if the installation wishes to modify the STRUDL object package, it requires this package, ICES/360 Source STRUDL-I and distribution 360D-16.2.005, ICES/360 Basic System and Language Processors.

PROGRAMMING SYSTEMS - ICES/360 ICETRAN and ICES/360 CDL.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and I/O devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162015

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.016
STRUCTURAL ENGINEERING SYSTEM SOLVER (STRESS) FOR S/360

AUTHORS: T. J. McCuch J. H. Scarborough

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Sun Oil Co. R&E
Computer Dept., (Room 410)
1608 Walnut Street
Philadelphia, Pennsylvania 19103

*** C 1298 - 03.8 08.0 10.1 45.1 - - - ***

DESCRIPTION - In the solution of structural engineering problems, the STRESS program is designed to analyze structures with prismatic members. This presentation represents a modification of the 1130 Version II of the STRESS program made to run on the S/360 Model 30. The 1130 version was written in FORTRAN with some subroutines written in 1130 Assembly Language. In the 360 version, the FORTRAN portions were unchanged or only slightly modified where necessary.

PROGRAMMING SYSTEMS - The Assembly Language subroutines were rewritten in FORTRAN, where possible, or in BAL. The program was compiled and tested with DOS Version III. Operating system required DOS.

MINIMUM SYSTEM REQUIREMENTS - 65,536 bytes of core storage, typewriter, a card reader, and two disk drives.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162016

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.2.017
ICES/360 OPTECH I

AUTHOR: Civil Engineering Lab.

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Lab.
Department of Civil Engineering
Massachussetts Institute of Technology
Cambridge, Massachusetts 02139

*** S MCE OPTK 15.2 15.3 - - - - - ***

DESCRIPTION - OPTECH is a ICES/360 subsystem developed to provide the engineer with a set of mathematical techniques for the solution of optimization problems. It consists of commands and processing routines. OPTECH includes capabilities of linear programming, network flow optimization, direct search non-linear programming, and all-integer linear programming. It features a small number of procedure initiating commands, plus a much larger number of commands which may be used to direct and modify procedures and which provide flexible problem solving capabilities. The OPTECH system is provided as a set of load modules which can be copied into a data set on direct access storage.

PROGRAMMING SYSTEMS - Programmed in ICES/360 ICETRAN and ICES/360 COL, and under PCP of OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), a card input and output device, and a printer output device. If OS/360 resides on more than 1-2311, then the OPTECH requirements for direct-access storage devices is increased correspondingly.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162017

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.018
BULKHEAD SHEET PILING ANALYSIS

AUTHOR: L. E. Rivas

DIRECT TECHNICAL INQUIRIES TO:
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EDP Syst. Supervisor
Metro Dade County Public Works, Dept. RM.815
1351 N.W. 12th Street
Miami, Florida 33125

*** N - - - - - - - - - - ***

DESCRIPTION - Given a description of the soil and its conditions, the program is capable of analyzing the structural requirements for bulkhead sheet pile. The input parameters consist of the weight of the soil, depth of soil layer, angle of internal friction, angle of wall friction, soil condition, slope of soil on both sides of bulkhead, slope of bulkhead, amount of surcharge, and location of the anchor. The output consists of the location of point of zero pressure, minimum penetration required, tension of anchor, location of point of zero shear, maximum bending moment, anchor and deadman dimensions and location of deadman. CHECK OUT STATUS - The program has been applied to a number of actual jobs where it has proved successful. SAMPLE RUNNING TIME - Each sample can be run in approximately 10 seconds once the program has been catalogued in the Core Image Library.

PROGRAMMING SYSTEMS - The main program was written in Basic FORTRAN IV, subroutine RUNDAT was written in Assembler; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - 32K system/360 with reader

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and printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162018

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.2.019 *N
ICES/360 STRUDL-II

AUTHOR: Civil Engineering Systems Lab.

DIRECT TECHNICAL INQUIRIES TO:
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*** S MCE 06.7 16.1 16.8 - - - - - ***

DESCRIPTION - ICES/360 STRUDL-II is an ICES/360 subsystem for the solution of structural engineering problems. It consists of commands and processing routines. It has been generated and tested as part of ICES/360 using OS/360 Versions 4 through 14.4 on S/360 models 40, 65 and 75. ICES/360 STRUDL-II; may be used to perform preliminary static and exact static and dynamic analyses of geometrically linear and non-linear framed and continuous structures. Members may be rigidly connected or pinned and joints may be fixed, pinned, on rollers or elastic supports. In addition, capabilities exist for frame member selection and optimization and reinforced concrete code checking against ACI 318-63 and reinforced concrete design. Data may be stored, modified in any way, retrieved and subsetted. Detailed output, both numerical and plotted, useful for performing and checking designs may be requested, all using natural-language engineering oriented commands.

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and ICES/360 CDI. ICES/360 STRUDL-II is one of several engineering subsystems which have been developed as part of the ICES/360 system. To operate any of these subsystems, an organization requires certain basic ICES programs which are not included as part of ICES/360 STRUDL-II. Therefore, in addition to this distribution, an installation must also order either distribution 360D-16.2.004, ICES/360 Basic System, or distribution 360D-16.2.005, ICES/360 Basic System and Language Processors. Only one of these is required. See the appropriate abstracts for a description of the material provided in these distributions.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and input and output devices. If OS/360 resides on more than one 2311, then the STRUDL requirements for direct-access storage are increased corresponding.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Load modules and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162019

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.020
COLUMN DESIGN - WORKING STRESS METHOD

AUTHOR: T. Bricher

DIRECT TECHNICAL INQUIRIES TO:
T. Bricher
State Hwy. Bldg. Room 327
Salem, Oregon 97310

*** N - CLDZ - - - - - - - ***

DESCRIPTION - The Column Design Program - Working Stress Method determines the amount and placement of reinforcing steel for a cracked or uncracked concrete section of given dimensions based on given values of allowable concrete and steel stresses, modulus of elasticity ratios, and loads DESCRIPTION - The Column Design Program - Working Stress Method determines the amount and placement of reinforcing steel for a cracked or uncracked concrete section of given dimensions based on given values of allowable concrete and steel stresses, modulus of elasticity ratios, and loads consisting of an axial load and either uniaxial or biaxial

CONTINUED FROM PRIOR COLUMN

bending. The shape of the column may be round, oblong, rectangular, or rectangular with cutouts at each corner. Program criteria for cracked and uncracked sections are based on American Association of State Highway Officials (AASHO) specifications so that the program is directly applicable to bridge design problems; however, the solution of the general flexure formula remains the same for other applications. The program consists of a main line program with seven subroutines. In addition, the program calls on a "reread" subroutine which allows any number of separate jobs to be stacked in any order.

PROGRAMMING SYSTEMS - Written in FORTRAN IV and has been compiled, link edited, and tested using OS Version 14 on a S/360 Model G40.

MINIMUM SYSTEM REQUIREMENTS - Runs on any S/360 Model F40 or larger. A card reader and an on-line printer (132 print positions) are required for execution.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162020

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.2.021 *N
ICES/360 SOURCE TRANSET I

AUTHOR: Civil Engineering System Lab.

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Lab.
Dept. of Civil Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

*** S MCE TRSRI 06.7 15.1 - - - - - ***

DESCRIPTION - TRANSET is an ICES/360 subsystem for the solution of transportation network analysis problems. It consists of commands, processing routines, and information files. TRANSET includes traffic assignment and minimum path transportation capabilities as well as transportation information file generation, modification, storage, and retrieval capabilities. Its commands are natural-language statements of transportation planning analysis steps and provide for extreme flexibility in use and powerful problem-solving capabilities. ICES/360 TRANSET I is composed of two distribution packages. These are a) the object package - ICES/360 TRANSET I (360D-16.2.011) and b) this package, the source package - ICES/360 Source TRANSET I. The former package is composed of object modules of ICES/360 TRANSET I. The latter package is composed of all source material for ICES/360 TRANSET I. The first submittal of the source material (Mod 0 - this package) corresponds exactly to the third submittal of the object material (Mod 2 - submitted May, 1969).

PROGRAMMING SYSTEMS - Written in ICES/360 ICETRAN and in ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360 Versions 5 through 15/16 on S/360 Models 40, 65 and 67.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 40, 128K, with two 2311 Disk Drives (or their equivalent), a card input and output device, and a printer output device. If OS/360 resides on more than one 2311, then the TRANSET requirement for direct-access storage devices is increased correspondingly. A TRANSET problem runs as a normal job under PCP of OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162021

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.022 *N
GC-21

AUTHOR: M. J-J Goel

DIRECT TECHNICAL INQUIRIES TO:
M. J-J Goel
Universite d'Ottowa
Faculte des Sciences Pures et Appliquees

CONTINUED FROM PRIOR PAGE

Dept. Mathematiques
Ottawa 2, Canada

*** N - - - - - - - - - - ***

DESCRIPTION - This program allows calculation of the displacements, internal moments and reactions of a plate of any shape in bending. The plate can be supported in any possible way and loaded by any external force. The plate can be of constant or variable thickness. It can be simply supported or clamped on separate points or along segments of straightline. The values of the displacement at some points can also be imposed; this possibility is used in the analysis of the subsidence of a support. The external model, the unknown is the vertical displacement of the middle plane of the plate. The numerical calculation is then performed by the finite element method. The curved boundary is treated as polygonal lines; the plate is divided into triangular and rectangular elements; both types can be used together in a same computation.

PROGRAMMING SYSTEMS - Written in FORTRAN IV; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - The program runs on a S/360 Model 40 with 128K minimum. Modifications to the program require a 256K machine for re-compilation.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162022

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL		none		none

360D-16.2.023 *N
ICES/360 COGO-I SOURCE

AUTHOR: CIVIL ENGINEERING SYSTEMS LABORATORY

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Laboratory
Department of Civil Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

*** S MCE COGOI - - - - - - - ***

DESCRIPTION - ICES/360 COGO-I is an ICES/360 subsystem for civil engineering geometrics.

PROGRAMMING SYSTEMS - COGO is programmed in ICES/360 ICETRAN and ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360, Versions 5 through 17 on S/360 Models 40, 50, 65, and 75. This release contains the source code for release 360D-16.2.006, ICES/360 COGO-I Object Release.

MINIMUM SYSTEM REQUIREMENTS - ICES/360 requires as a minimum machine a S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent) and input and output devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162023

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.024 *N
ICES/360 ROADS I SOURCE

AUTHOR: Civil Engineering Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Laboratory
Department of Civil Engineering
Massachusetts Institute of Technology
77 Massachusetts Ave., Cambridge, Mass. 02139

*** S MCE ROADI 16.8 - - - - - - ***

DESCRIPTION - ICES/360 ROADS I is an ICES/360 subsystem for the solution of problems in highway location and design. It consists of an engineering language and associated commands, processing routines, and information files.

CONTINUED FROM PRIOR COLUMN

Roads can be used in the location and design of almost any type of roadway, including highways, waterways, railroads, and dykes. It is applicable after a general location corridor has been defined and can be used throughout the resulting design process. Major phases include a digital terrain model of both surface and subsurface materials; alignment and profile geometry integration with ICES/360 COGO I; flexible roadway cross section design and template changes under the control of engineering commands; and the simulation of individual vehicles to determine the effects of roadway geometry and traffic on vehicle performance. Information such as typical roadway cross sections, the multi-material terrain model, and as-designed roadway cross sections are stored directly on secondary storage. Provision is made for access to, and transfer from, the geometry routines and data tables of COGO. ROADS is based on the concepts and experience of the Digital Terrain Model (DTM), COGO and Vehicle Simulation and Operating Cost Systems.

PROGRAMMING SYSTEMS - ROADS is programmed in ICES/360 ICETRAN and in ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360 Versions 5 through 16 on S/360 Models 40, 50, 65, 67, and 75.

MINIMUM SYSTEM REQUIREMENTS - ICES/360 ROADS I requires as a minimum machine a S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), a card input and output device, and a printer device. While it is feasible to operate ROADS on a 2-2311 drive system, it is recommended that at least 3-2311 Disk Drives (or their equivalent) be used to avoid problem size and operational limitations. If OS/360 resides on more than one 2311, the ROADS direct access secondary storage device requirements are increased correspondingly. A ROADS problem runs as a normal job under PCP of OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162024

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.025 *N
ICES/360 TABLE-II, OBJECT AND SOURCE

AUTHOR: CIVIL ENGINEERING SYSTEMS LABORATORY

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Laboratory
Department of Civil Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

*** S MCE TABS2 01.6 06.4 - - - - - ***

DESCRIPTION - ICES/360 TABLE-II is an ICES/360 subsystem for creating, editing, and subsetting files of tabular information. ICES/360 TABLE-II may be used to store integer, real, double precision, and alpha string data in rectangular tables with rows and columns identified by arbitrary symbolic variables. In addition, any entry for a row and column can be a list of data. Table data may be used in any ICES subsystem, stored and retrieved with a special set of functions provided with TABLE-II. Special sequences based on data in a table may be established and used with retrieval functions to sequence trial designs.

PROGRAMMING SYSTEMS - TABLE is programmed in ICES/360 ICETRAN and ICES/360 CDL. It has been generated and tested as part of ICES/360 using OS/360 Versions 5 through 14 on S/360 Models 40, 50, 65, 67, and 75.

MINIMUM SYSTEM REQUIREMENTS - ICES/360 TABLE-II requires as a minimum machine a S/360 Model 40, 128K, with 2-2311 Disk Drives (or their equivalent), and input/output devices. If OS/360 resides on more than one 2311, the TABLE requirements for direct access storage devices are increased correspondingly.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - ICES/360 TABLE-II is composed of a single distribution package. This package contains seven files: (1) the object modules for TABLE-II, (2) the Command Data Blocks, (3) a sample problem, (4) the source material for the TABLE-II storage and retrieval functions, (5) the Command Definition Language input for language definition, (6) the source programs for TABLE-II, in both ICETRAN and S/360 Assembler languages, and (7) input to SETGEN procedure for formation of TABLE-II load modules.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162025

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.026
ICES/LEASE-I

AUTHOR: Civil Engineering Systems Laboratory

DIRECT TECHNICAL INQUIRIES TO:
Civil Engineering Systems Laboratory
Department of Civil Engineering
Massachusetts Institute of Technology
Cambridge, Mass. 02139

*** S MCE - - - - - - - - - ***

DESCRIPTION - ICES/360 LEASE-I is an ICES/360 subsystem that performs stability analysis of arbitrary slopes by the method of slices. The trial failure surfaces are arcs of circles. The program will locate the radius having minimum factor of safety at each of a specified set of trial centers. Alternatively, a search routine is provided that can be useful in locating the center and radius of the critical failure surface. Explicitly defined circles can also be analyzed. Total or effective stress methods may be used.

PROGRAMMING SYSTEMS - LEASE-I is programmed in ICES/360 ICETRAN and in ICES/360 CDL. ICES/360 LEASE-I is one of several engineering subsystems developed as part of the ICES/360 system. To operate any of these subsystems, basic ICES programs not included in the ICES/LEASE I distribution are required. An organization must have distribution 360D 16.2.005, ICES/360 Basic System and Language Processors.

MINIMUM SYSTEM REQUIREMENTS - A minimum machine is an S/360 Model 40, 128 K, with two 2311 disk drives (or equivalent) and a printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Load modules, card image input and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162026

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.2.028 *N
ICES/360 STRUDL - II - CSAS16

AUTHOR: Department of Civil Engineering

DIRECT TECHNICAL INQUIRIES TO:
Department of Civil Engineering
University of Toronto
Toronto 181, Ontario, Canada

*** S TCV CS16 - - - - - - - ***

DESCRIPTION - ICES/360 STRUDL-II-CSAS16 is an addition to the member selection component of the ICES/360 STRUDL-II subsystem of ICES/360. CSAS16 consists of commands and processing routines which are programmed in ICES/360 CDL and ICES/360 ICETRAN respectively. ICES/360 STRUDL-II-CSAS16 may be used for frame member selection and code checking in accordance with CSA-S16-1969. CSAS16 includes extended STRUDL profile tables for I-beams, hollow section and Canadian welded wide flange shapes.

PROGRAMMING SYSTEMS - Written in ICES/360 CDL and ICES/360 ICETRAN. It has been generated and tested as part of ICES/360 STRUDL-II Version I Mod 0 using OS/360 Versions 14 through 16 on a S/360 Model 65. ICES/360 STRUDL-II-CSAS16 is an addition to ICES/360 STRUDL-II, one of several engineering subsystems developed as part of the ICES/360 system. Therefore, in order to operate this program distribution, the installation must also order distribution 360D-16.2.019, ICES/360 STRUDL-II. In order to operate the STRUDL subsystem the installation must also order distribution 360D-16.2.005, ICES/360 Basic System and Language Processors. See the appropriate abstracts for information regarding the contents of these distributions. 360D-16.2.005, ICES/360 Basic System and Language Processors. See the appropriate abstracts for information regarding the contents of these distributions.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128K with 2-2311 Disk Drives (or their equivalent), and I/O devices.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D162028

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.3.001
ECONOMIC EVALUATION AND SCREENING PROGRAM FOR RESEARCH PROJECTS

AUTHOR: P. E. West

DIRECT TECHNICAL INQUIRIES TO:
R. W. Cicco
Morton Chemical Co.
110 N. Wacker Drive
Chicago, Ill. 60606

*** C 1097 - - - - - - - - ***

DESCRIPTION - This program assesses the probable worth of chemical research projects in their early stages of development when a minimum of information is available. It is designed to serve as a tool in research guidance evaluation and is relatively quick and easy to use. With this program the factors controlling the economics of the chemical process can often be found and varied for effect.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Uses an IBM/360-30 with 32K byte memory, one 2311 Disk Drive, one 2400 Tape Unit, one card reader and one on-line printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D163001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.3.002 *N
PULSE TESTING VIA THE FAST FOURIER TRANSFORM

AUTHORS: Carlos Ray Dollar Cecil L. Smith
Paul W. Murrill

DIRECT TECHNICAL INQUIRIES TO:
Carlos Ray Dollar
Department of Chemical Engineering
Virginia Polytechnic Institute
Blacksburg, Virginia

*** S VPI - 06.5 10.1 45.1 - - - - ***

DESCRIPTION - Subroutine REFFT accomplishes a fast, accurate transformation of time domain pulse response data to frequency response data using the Real-Valued Fast Fourier Transform. The subroutine is written in FORTRAN IV and has been compiled and tested on a 7040, a S/360 Model 50, and a S/360 Model 65. Given time domain input and output pulse data the subroutine will calculate and print magnitudes, phase angles and associated frequencies.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - A minimum of 16K of core storage is required and will run on a S/360 Model 30.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D163002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.4.001
ECAP/360-E ELECTRONIC CIRCUIT ANALYSIS PROGRAM

AUTHOR: G. R. Hogsett

CONTINUED FROM PRIOR PAGE

DIRECT TECHNICAL INQUIRIES TO:
G. R. Hogsett
IBM Corporation
9045 Lincoln Blvd.
Los Angeles, Calif. 90045

*** N - - 17.0 18.2 - - - - - ***

DESCRIPTION - The ECAP/360-E Electronic Circuit Analysis Program is an integrated system of programs which can be used by the electrical engineer in the design and analysis of electronic circuits. The system of programs can produce DC, AC, and/or transient analyses of electrical networks from a description of the connections of the networks (the Circuit Topology), a list of the corresponding circuit element values, a selection of the type of analysis desired, a description of the circuit excitation, and a list of the output desired. The engineer requires neither a knowledge of the internal construction of the system of programs nor computer programming techniques to use ECAP effectively.

PROGRAMMING SYSTEMS - Written in FORTRAN IV (E-level) Subset.

MINIMUM SYSTEM REQUIREMENTS - A Model 40 or greater, System/360 having at least 131,072 bytes of storage. ECAP/360-E is a conversion of the 1620 ECAP. Documentation is intended to be used in conjunction with the 1620 ECAP Users Manual (H20-0170). This manual should also be ordered when ordering ECAP/360-E.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.4.002 *M
2250 ECAP

AUTHOR: C. W. Day, Jr. G. R. Hogsett
D. Nisewanger W. H. Malone

DIRECT TECHNICAL INQUIRIES TO:
C. W. Day, Jr.
IBM Corporation
P. O. Box 7421
Long Beach, Calif. 90807

*** N - - 00.6 08.7 10.1 23.0 - - - ***

DESCRIPTION - This program is a graphical extension to a 100 Branch, 25 Node, System/360 Version of "1620 Electronic Circuit Analysis Program" (ECAP) (1620-EE-02X). It runs under OS/360 with 2250 EXPRESS (Type I) and GPAK (Type III) support. After minor modification the program would work with a 4K buffer on less complex circuits. Using the 2250 as the sole means of man-machine communication, this program accepts circuit models either in schematic form or by means of ECAP source statements and produces selected plots (or lists) of the analysis results. It is intended that this tool be used in an iterative manner to achieve good circuit design efficiently.

PROGRAMMING SYSTEMS - Written in FORTRAN E.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40, 128k, one 2311, one printer or 2400 tape, and a 2250 (Model 1) with light pen, programmed function keyboard, absolute vectors and control, character generator, alphanumeric keyboard, and an 8K buffer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.4.003 *M
PANE - PERFORMANCE ANALYSIS OF ELECTRICAL CIRCUITS

AUTHORS: C. G. Hooks J. Eggerling

CONTINUED FROM PRIOR COLUMN

DIRECT TECHNICAL INQUIRIES TO:
J. Eggerling
IBM Corporation
P. O. Box 1900
Boulder, Colorado 80301

*** N - - 43.3 45.4 - - - - - ***

DESCRIPTION - PANE is an IBM S/360 computer program used to determine DC and AC steady state nominal, Monte Carlo statistical and worse case circuit performance. The program writes a set of real (DC analysis) or complex (AC analysis) circuit equations in matrix form from a free form English text input style topological description of the circuit components and their interconnections. The equations are solved algebraically, a FORTRAN subroutine is written, compiled, and run to determine nominal, statistical and worse case circuit performance. A detailed description of the program and operating instructions is presented.

PROGRAMMING SYSTEMS - Source language is written in E-level FORTRAN except for subroutines required to perform character manipulation which are written in F-level Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - 256K core storage. The program is implemented for OS E-Level FORTRAN.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.4.004
POWER SYSTEM LOAD-FLOW PROGRAM

AUTHORS: A. G. Montgomery N. M. Peterson
D. L. McLaughlin G. N. Sherburne
S. L. Sandness

DIRECT TECHNICAL INQUIRIES TO:
D. L. McLaughlin
Northern States Power Co.
414 Nicollet Mall
Minneapolis, Minn. 55401

*** N - - - - - - - - - ***

DESCRIPTION - The NSP/LF program is designed to assist Electric Power System Engineers in distribution system studies. The program calculates the power flow for a circuit, indicating circuit sizing requirements necessary to meet the loading demands placed upon the distribution system. The program uses the Nodal-Iterative Method to arrive at a solution. During each calculation, reactive generation and tap-settings on LTC transformers are varied within limits to hold specified voltages constant. After achieving solution, area-interchange flows are checked and slack bus generation varied to meet the limits specified. This load flow program is one of the largest and most flexible of its kind in existance. The program can handle 1000 Buses and 1500 Lines. For area control, 40 Interchange Areas may be specified with flow control. Additionally, the results may be mapped and an area may be reduced to its equivalent circuit. Output reports include a listing of the customers input data. This assures the user of the completeness and correctness of the data. Following this data is the area interchange report showing area control information, low voltage, high voltage and overload summaries. Then the line flows for each line, network reduction data and mapped results are reported.

PROGRAMMING SYSTEMS - Source Language - written in FORTRAN; operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - The program is designed to operate in an overlayed structure. Program requires a 157K portion compiled under FORTRAN G. The program also requires a disk for storage of history records and for intermediate storage of data during execution.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none

CONTINUED FROM PRIOR PAGE

OPTIONAL	none	none	none

360D-16.4.005 *M
IBM SYSTEM/360 ELECTRIC POWER SYSTEM LOAD FLOW PROGRAM - OPERATING SYSTEM VERSION

AUTHOR: R. J. Zakocs

DIRECT TECHNICAL INQUIRIES TO:
R. J. Zakocs
IBM Corporation
3424 Wilshire Blvd.
Los Angeles, Calif. 90005

*** N - - 17.1 24.2 - - - - - ***

DESCRIPTION - This program has been designed to produce the results of a performance calculation on an electric power system under load, these results specifically to include the power and reactive flows in transmission lines and other facilities. The program uses the Nodal Iterative Method, generally accepted by the Electric Utility Industry as the most flexible for use in progressing from case to case in power system planning and operating studies. Extensive user-oriented features are included, so that the burdens of data preparation and answer interpretation are reduced to a minimum. The use of a disk-oriented approach permits the solution of extremely large power system networks without extensive core requirements.

PROGRAMMING SYSTEMS - Written in Assembler Language; operating under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 with 64K core storage, the Scientific Instruction Set and at least one 2311 Disk Storage Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-16.4.006 *M
IBM SYSTEM/360 ELECTRIC POWER SYSTEM LOAD FLOW PROGRAM - DISK OPERATING SYSTEM VERSION

AUTHOR: R. J. Zakocs

DIRECT TECHNICAL INQUIRIES TO:
R. J. Zakocs
IBM Corporation
3424 Wilshire Blvd.
Los Angeles, Calif. 90005

*** N - - 17.1 24.2 - - - - - ***

DESCRIPTION - This program has been designed to produce the results of a performance calculation on an electric power system under load, these results specifically to include the power and reactive flows in transmission lines and other facilities. The program uses the Nodal Iterative Method, generally accepted by the Electric Utility Industry as the most flexible for use in progressing from case to case in power system planning and operating studies. Extensive user-oriented features are included, so that the burdens of data preparation and answer interpretation are reduced to a minimum. The use of a disk-oriented approach permits the solution of extremely large power system networks without extensive core

PROGRAMMING SYSTEMS - Written in Assembler Language; operating under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 with 32K core storage, the Scientific Instruction Set and at least one 2311 Disk Storage Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-16.4.007 *M
S/360-ECAP-DOS ELECTRONIC CIRCUIT ANALYSIS PROGRAM FOR THE IBM S/360 48K DOS VERSION

AUTHORS: J. Boericke R. F. Raywood

DIRECT TECHNICAL INQUIRIES TO:
J. Boericke
IBM Corporation
7 Penn Center Plaza
Philadelphia, Pa. 19103

*** N - ECAPB 16,8 17.1 - - - - - ***

DESCRIPTION - The ECAP/360-DOS Electronic Circuit Analysis program is a system of programs which can be used by the Electrical Engineer in the design and analysis of electronic circuits. The system of programs can produce AC, DC, or transient analysis of electrical networks from a description of the circuit topology, a list of the corresponding circuit elements, type of circuit excitation, and selection of the type of analysis output desired. The engineer requires neither a knowledge of the internal construction of the system of programs nor computer programming techniques to use ECAP effectively.

ECAP/360-DOS is a segmentation of ECAP/360-E into a multi-phase structure operating in 48K under DOS. ECAP/360-E was designed to operate in 132K under the Operating System. As a result of the multi-phasing of ECAP/360-E into 48K, the problem size has been reduced to 60 branches and 20 nodes from 200 branches and 50 nodes.

PROGRAMMING SYSTEMS - ECAP/360-DOS was written in FORTRAN IV; operating under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 30 with 48K or greater.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.4.008
IBM SYSTEM 360 SHORT CIRCUIT ANALYSIS FOR THE ELECTRIC UTILITY INDUSTRY

AUTHORS: R. F. Allen K. Geib
E. Loikits

DIRECT TECHNICAL INQUIRIES TO:
R. F. Allen
IBM Corporation
80 North West Highway
Des Plaines, Illinois 60016

*** N - - - - - - - - - ***

DESCRIPTION - The Short Circuit Analysis Program simulates an electrical power system for power flows and voltages when abnormal operating conditions occur during a balanced or unbalanced fault on the system. The program uses the z matrix solution technique to simulate a maximum electrical transmission system consisting of 500 buses with 1000 transmission lines. Up to 50 buses may be retained by the program at one time.

Two types of fault conditions may be calculated by the program (1) a three phase fault study which may include either reactances only, or both resistances and reactances of the electrical system, and (2) a line to ground fault study (x only) which may include the mutual couplings within the electrical system. The information obtained from this program can be used to determine circuit breaker interrupting ratings as well as relay settings for the transmission system under consideration.

PROGRAMMING SYSTEMS - Programming language - FORTRAN IV. Operating system required - DOS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360, 65K core storage, a card reader and a printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none

CONTINUED FROM PRIOR PAGE

		DTR	9/1600	29	none
		DTR	7DC/800	26	none
OPTICNAL	none	none			none

360D-16.4.009 *M

LISA 360 A PROGRAM FCR LINEAR SYSTEMS ANALYSIS

AUTHOR: E. T. Johnson K. L. Deckert

DIRECT TECHNICAL INQUIRIES TO:
K. L. Deckert
IBM Corporation
ELD. 014, Dept. 555
SDD - San Jose, Calif.

*** N - - 43.0 45.0 - - - - - ***

DESCRIPTION - This is an integrated package of OS/360 FCRTRAN IV programs for analyzing linear systems using Laplace transform techniques. It analyzes electrical networks, transfer functions, two-block control systems, and any system of linear equations whose coefficient matrix has polyncmial elements. Inputs may be a topological circuit description, tranfer function, matrix equation, or block diagram. Outputs may be poles and zeros, frequency and transient response, root locus, or sensitivity. Both listings and plots may be obtained. The programs feature a free format, applications-oriented input language, with extensive user control of output. Several computational and programming techniques extend the size of problem the program can handle, reduce computation time, and conserve storage.

PROGRAMMING SYSTEMS - Written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D164009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
CPTIONAL	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01

360D-16.4.010 *M

SYNTH1 (A COMPUTER PROGRAM FOR THE DESIGN OF REACTIVE NETWORKS FROM A SET CF ARBITRARY POLES AND ZEROES)

AUTHOR: G.L. Bass

DIRECT TECHNICAL INQUIRIES TO:
E. Christian
ITT Telecommunications
2912 Wake Forrest Road
Raleigh, North Carolina 27602

*** N - - 10.1 - - - - - - ***

DESCRIPTION - This program will develop the design polynomials needed to design and evaluate a passive reactive electrical network from a specified pole-zero pattern of the characteristic or transfer loss function. It may also be used to analyze these networks. The program was written in FORTRAN IV, G level for use as a teaching aide in an advanced network design course. It may have some value as an industrial tool.

PROGRAMMING SYSTEMS - Written in FORTRAN IV, G level. The root program DPRQD from the Scientific Subroutine Package is required for the double precision mode. For use of a quadruple precision root program, the Multi-precision Arithmetic Package (MPA) (360D-40.4.002) is required. DPRQD is part of 360A-CM-03X.

MINIMUM SYSTEM REQUIREMENTS - The program requires 6K of core memory. Any model of the IBM 360, Model 30 and higher can be used for this program if it has the Floating Point feature.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D164010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT

CONTINUED FROM PRIOR COLUMN

BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.5.001

HELICAL COMPRESSION SPRING OPTIMIZATION PROGRAM

AUTHOR: E. R. Pollock

DIRECT TECHNICAL INQUIRIES TO:
B. R. Pollock
The Weatherhead Co.
Research and Development Dept.
300 E. 131st Street
Cleveland, Ohio 44108

*** N - - 16.1 16.2 16.4 16.8 - - - ***

DESCRIPTION - The S/360 FORTRAN Helical Compression Spring Optimization program designs round wire Helical compression springs. The program must be stored in the users Core Image Library to be called out later by the execute procedure. The program has been written with the intention of making the execute procedure to call the program from the Core Image Library as simple as possible. The designer can enter his input conditions with relative ease with the use of a descriptive form.

The input to the program permits the designer to choose the wire type, load conditions, coil diameter, ends, type of service, and application of the spring. A total of 25 cards (including 4 control cards) is needed to initiate the spring program. The program is intended for use by anyone connected with the design of a compression spring. The spring program is written in four phases which are linked together by an IBM written overlay supervisor.

PROGRAMMING SYSTEMS - Programming language - FORTRAN IV. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 and up, an on-line printer (132 print positions), card reader and punch, and two disk drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D165001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION TYPE	MEDIUM CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-16.5.002 *M

GENERAL THERMAL PIPE STRESS AND DEFLECTION PROGRAM

AUTHOR: J.S. Webster

DIRECT TECHNICAL INQUIRIES TO:
J.S. Webster
State Electricity Commision
15 William Street
Melbourne Victoria Australia

*** C 8006 - 16.3 16.6 - - - - - ***

DESCRIPTION - This program is directly adapted form program 1620-09.5.012 developed in 1964 at Southern Services Incorporated, Birmingham, Alabama, by E.J. Orth, Jr., and J. Lewis.

The program computes the thermal stresses and deflections arising in a three dimensional pipe network. The System/360 version is written in FORTRAN IV and is dimensioned to handle 30 branches, 15 branch points, and any number of loops and anchors, on a computer having a core storage of 128K bytes.

Provision is made to handle rigid stops, spring restraints, external forces, inflexible members, end point movements, and changes of pipe dimensions and properties within any branches of the network.

The program consists of two parts - DATA CHECKING and PRODUCTION.

The DATA CHECKING program performs a rigorous error check on the data file. The data file consists of system topological data and, for each branch, co-ordinates of the first point reference the global origin, expansion and movement data, co-ordinate differences between tangent intersections and bend radii. In addition to noting detected errors, a list of co-ordinates for each point is given to facilitate checking against anchor co-ordinates.

The PRODUCTION program applies the alogorithm described in the supplement to Kellogg's book "The Design of Piping Systems", second edition, to calculate flexibility matrices. Then deflections at branch points and reactions of each branch, all reference the global origin, are calculated

CONTINUED FROM PRIOR PAGE

using the algorithm of Chen - ASME paper No. 59-APM-24. A novel approach to the solution of the matrix is used to take advantage of sparsity. For each nominated point of each branch, the program computes deflections and restraining reactions with reference to the point, and combined stresses. The sum of the restraining reactions about each branch point is also given.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360, and uses 128K of storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D165002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-16.6.001
A SET OF SYSTEM/360 ASSEMBLER LANGUAGE PROGRAMS FOR PROCESSING DIGITAL SEISMIC DATA

AUTHOR: R. N. Hodgson

DIRECT TECHNICAL INQUIRIES TO:
R. N. Hodgson
IBM Corporation
6900 Fannin
Houston, Texas 77025

*** N - - 17.4 - - - - - - ***

DESCRIPTION - A set of programs to adjust, summarize, and refine seismic data used in petroleum exploration. Each program is a separate stand-alone program (not a subroutine), although some of the programs are data dependent on others. All programs are written in Assembler Language and are designed to run under the IBM Basic Operating System (8K Disk). The programs included in the set are-

- Disk format for seismic programs.
- Data preparation.
- Normal moveout computation.
- Demultiplex.
- Normal moveout application.
- Stacking.
- Autocorrelation and the power density spectrum.
- Band pass filtering.
- Point sort.
- Multiplex.
- Inverse operator determination (FORTRAN).

PROGRAMMING SYSTEMS - Written in Assembler Language; operating under BOS/360.

MINIMUM SYSTEM REQUIREMENTS - The required S/360 machine configuration is 131K, Model 40 with Decimal and Floating Point instructions, 2 selector channels, 2-2311's, 2-2400 Tape Units. If data on seven track tapes is to be processed, then both tapes must be seven track.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D166001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-16.8.002
COMPUTER CALCULATION OF FREQUENCY RESPONSE FUNCTIONS FROM STEP RESPONSE DATA

AUTHORS: L.H. Fink
C.W. McElwee

DIRECT TECHNICAL INQUIRIES TO:
L.H. Fink
Philadelphia Electric Company
900 Sansom Street
Philadelphia, Pennsylvania 19105

*** N - - - - - - - - - ***

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DESCRIPTION - Subroutine BODE was constucted to determine the frequency response of a system whose transient response to a step function is known. The program is based on a procedure developed by Samulon which includes phase and magnitude correction factors. Frequency response field testing requires that a frequency source be applied to the system under study and magnitude and phase shift determined for each individual frequency of interest. Through the use of this program, it is necessary to apply only a step change to the system in the field and record its transient the frequency response of a system whose transient response to a step function is known. The program is based on a procedure developed by Samulon which includes phase and magnitude correction factors. Frequency response field testing requires that a frequency source be applied to the system under study and magnitude and phase shift determined for each individual frequency of interest. Through the use of this program, it is necessary to apply only a step change to the system in the field and record its transient response. The transient response amplitude at discreet points is fed into the program along with the time interval between each data point. The program supplies as its output the desired response data.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - Those associated with the FORTRAN IV compilers.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D168002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-17.1.001
QUANTITATIVE ANALYSIS WITH ELECTRON MICROPROBE ANALYZER

AUTHOR: S. S. So

DIRECT TECHNICAL INQUIRIES TO:
S. S. So
IBM Corporation
P.O. Box 6
Endicott, N.Y. 13764

*** S EL EPMP - - - - - - - ***

DESCRIPTION - A description of two FORTRAN IV computer programs is presented to simplify quantitative and semiquantitative analysis with the electron microprobe analyzer. The first program, EPMP1, determines the weight fraction of each element in a specimen from the characteristic X-RAY intensity measurements of the specimen and the standards. The second program, EPMP2, calculates the relative characteristic X-RAY intensities of all the elements in a specimen by assuming the composition of the specimen to be known. The correction procedure includes dead time correction, one of two background corrections (either constant background or background depending on composition), Philiberts absorption correction modified by Duncumb and Shields, one of three fluorescence corrections (either Birks, Castaings, or Reeds), and a compound standard correction. The effects of the absorption and the fluorescence of each element in the specimen are easily seen from the output results. Versatility, efficiency, and ease of operation are emphasized in the programs. Program listings, input data format, and various examples showing the usage of the programs have been included in the appendices.

PROGRAMMING SYSTEMS - Programming language - FORTRAN IV. Operating system required - OS/360 with FORTRAN IV Compiler (level H).

MINIMUM SYSTEM REQUIREMENTS - Those required by OS/360; the FORTRAN IV Compiler; 36K core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D171001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-17.2.005 *M
SUMX - A DATA SUMMARIZATION PROGRAM FOR THE IBM/360

AUTHORS: Mr. M. J. Beniston M. J. Kingston

CONTINUED FROM PRIOR PAGE

DIRECT TECHNICAL INQUIRIES TO:
Mr. M. J. Beniston
IBM Corporation
2670 Hanover Street
Palo Alto, California 94304

*** N - - - - - - - - - - ***

DESCRIPTION - SUMX is a data summarization program designed primarily to aid physicists but general enough to be quite useful to others. SUMX reads data from a summary data tape and constructs displays of subsets of this data as specified by user control cards. The types of displays include one or two-dimensional histograms, scatter diagrams, ideograms, and resolution functions. SUMX also can produce new summaries of subsets of the original data either as ordered lists or new data tapes. The present program is based on the original SUMX written by Lynn Champomier at the University of California Lawrence Radiation Laboratory in Berkeley, California.

PROGRAMMING SYSTEMS - Written in FORTRAN and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - IBM/360, 128K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Berkeley Report UCRL - 11222 for programming and operating details. If the user desires full documentation of SUMX he should obtain a copy of UCRL-11222 directly from the university.
MACHINE READABLE - Appropriate Material Delivered.

OPTIONAL PROGRAM PACKAGE - None

ORDERING INFORMATION: PROGRAM NUMBER 360D172005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-17.2.006 *M
CERN SUMX - A DATA SUMMARIZATION PROGRAM FOR THE IBM/360

AUTHORS: Dr. M. J. Beniston Mr. H. R. Penafiel

DIRECT TECHNICAL INQUIRIES TO:
Dr. M. J. Beniston
IBM Corporation
2670 Hanover Street
Palo Alto, California 94394

*** S IPA - 13.1 - - - - - - ***

DESCRIPTION - CERN SUMX analyzes information about large number of events and produces histograms, scatter diagrams, lists and ordered lists. Facilities are provided to select subsets of events according to criteria defined on control-cards, and to allow the user to add routines for computing event by event quantities not immediately available. The program was originally written at Berkeley, but the present version was completely rewritten at CERN in 1965-1966. (SUMX 466, Version 5.25).

PROGRAMMING SYSTEMS - Written in FORTRAN IV, Level H for S/360.

MINIMUM SYSTEM REQUIREMENTS - 256K without overlays, three tape drives, recommended minimum of three disk drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D172006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-17.2.009 *N
ON-LINE SUMX

AUTHORS: S.K. Howry H.R. Penafiel W. McGee

DIRECT TECHNICAL INQUIRIES TO:
S. K. Howry
Standford Lineary Accelerator Center
2575 Sand Hill Road
Menlo Park, California 94305
or
H. R. Penafiel or W. McGee
IBM Scientific Center

CONTINUED FROM PRIOR COLUMN

Palo Alto, California

*** S SLA - 03.0 06.7 - - - - - ***

DESCRIPTION - A group of programs, called SUMX, is used for statistically analyzing high-energy physics data by batch-processing techniques. Against this backgrcund, the write-up discusses the first phase of a project directed toward placing the SUMX user on-line via a display console. On-Line SUMX provides a helpful interactive mode of computer use in an inherently difficult application area. The experimental environment of the data source is discussed. Presented are function of component programs as well as the types of statistical analyses performed.

On-Line SUMX is a S/360 program that enables the user to control the summarization and display of any data file via the 2250 Display Console. Although intended primarily for experimental physicists, the program should be useful to others who must summarize large amounts of data in order to derive meaning from it. The program capitalizes cn the unique abaility of a CRT display device to present data in forms and at speeds that cannot be attempted on ccnventional output devices, and thus it provides a useful interactive mode of computer use in an inherently difficult application area.

PROGRAMMING SYSTEMS - On-line SUMX is written in 360 OS FL4H, and operates under OS/360 Release 12 and up. OS/360 must contain the following software support: Graphic Programming Services... FORTRAN Library Routines... FORTRAN IV Compiler, both H and G for Release 12 and 13 and version H only for Release 14 and up.

MINIMUM SYSTEM REQUIREMENTS - CPU with at least 131K core storage... card reader and printer... one 2311 or 2314 Disk Drive for storage of the program files... at least one tape drive for the user's input data summary file... a 2250 Model 1 with alphnumeric, character generator and absolute vector features.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D172009

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-17.4.001 *M
SURFACE TECHNIQUES, ANNOTATION AND MAPPING PROGRAMS FOR EXPLORATION, DEVELOPMENT AND ENGINEERING

AUTHORS: D. W. Gussow R. J. Hunter
H. Korfage B. Pellant

DIRECT TECHNICAL INQUIRIES TO:
D. G. Bruneau
IBM Corporation
844 Don Mills Road
Don Mills, Ontario, Canada

*** N - - 16.2 16.6 16.8 17.1 - - - ***

DESCRIPTION - This set of thirteen programs is adaptable to application areas (e.g. Petroleum exploration, mining, civil engineering, meteorology, oceanography) which require the quantitative description of surfaces. Programs are included for making numerical and analytical approximations to a set of three co-ordinate values defining a surface, for manipulating one or more of these surfaces, and for preparing a display of surface geometry in the form of printed or plotted annotated contour maps.

PROGRAMMING SYSTEMS - Programming language - Mainly USASI Basic FORTRAN, with 8 small BAL subroutines. Operating system required - DOS/360.

MINIMUM SYSTEM REQUIREMENTS - System/360 Model F with Floating Point feature, 1-2311, 1-card reader, 1-printer. Optional Equipment: On or off-line plotting device. Very general exits have been provided for users to supply support for a plotting device. Sample linkages for a drum plotter are included.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D174001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none

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OPTIONAL	none	none	none

360D-17.4.002 *M
SUBROUTINES FOR COMPUTING THE PARAMETERS OF THE ELECTROMAGNETIC RADIATION SCATTERED BY A SPHERE

AUTHOR: J.V. Dave

DIRECT TECHNICAL INQUIRIES TO:
J. V. Dave
IBM Scientific Center
2670 Hanover Street
Palo Alto, California 94304

*** N 16.4 17.1 17.3 17.7 - - - - - ***

DESCRIPTION - There are two subroutine programs in FORTRAN IV G language for IBM System/360 computers. They can be used for computing the various parameters of the radiation scattered by a sphere (Mie scattering) when it is illuminated by a radiation of known wave length. The main difference between these subroutines is the procedure used in computations of one of the functions. As a result, DAMIE requires a storage of 11,962 bytes for obtaining values of parameters in 200 different directions, while DBMIE requires 123,868 bytes. However, the results obtained with DAMIE are reliable for large spheres (size parameter 1000) only if its material is non-absorbing, or very weakly absorbing. The results obtained with DBMIE are expected to be reliable under all conditions. This program is of basic importance in several diversified fields such as planetary optics, laser, radar, and searchlight applications, and holography.

PROGRAMMING SYSTEMS - Written in FORTRAN IV G language.

MINIMUM SYSTEM REQUIREMENTS - Any System/360 configuration which supports OS/360 and includes 256K bytes of core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Subroutine programs and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D174002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-17.5.001
360 BIOLOGICAL REFLEX ANALYTICAL PROGRAM

AUTHOR: F. Delcomyn W. J. Davis

DIRECT TECHNICAL INQUIRIES TO:
F. Delcomyn
Dept. of Biology
University of Oregon
Eugene, Oregon 97403

*** S UOC - - - - - - - - ***

DESCRIPTION - This program was designed to quantify the relationship between a sinusoidal and/or stepwise sensory input and muscle or nerve potential output in biological systems. Measurements of the spacing of the digital biological events are fed to the program and several measures of the influence of the sinusoidal and/or stepwise input on that spacing are calculated and printed. The biological signals may consist of individual impulses or of bursts of impulses, and two different sinusoidal and one stepwise sensory input may be applied simultaneously.

PROGRAMMING SYSTEMS - The program was written in FORTRAN IV E for an IBM S/360/50, and requires the subroutine SIMQ from the IBM SSP in addition to the 16 supplied subroutines. Up to 499 digital input measurements, 149 single sinusoidal cycles and 74 double sine cycles can be handled. Operating System/360 is required.

MINIMUM SYSTEM REQUIREMENTS - Those required to run OS/360 (plus) a Model 50 system.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D175001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-17.7.001 *M
SUBROUTINE UCONIC

AUTHOR: E. T. Pitkin

DIRECT TECHNICAL INQUIRIES TO:
E. T. Pitkin
Box U-139
University of Connecticut
Storrs, Connecticut 06268

*** S UCC UCON 1 16.1 - - - - - ***

DESCRIPTION - Subroutine UCONIC, Double Precision is a general purpose subroutine designed for use in analysis of rocket and space vehicle orbits. It contains a universal solution of the two-body problem for all conic orbit shapes and energies. From a given initial position and velocity it computes these quantities at another given time and optionally; the gravity gradient matrix, transition matrix and inverse, second transition partial derivatives and, if perturbative accelerations are input through a user supplied subroutine, the perturbative derivatives of the initial conditions. In addition, the Lambert problem can be solved as an option. Ten combinations of these options are available by presetting an index in the call statement.

PROGRAMMING SYSTEMS - Written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - Any system that has FORTRAN IV Double Precision capability.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D177001

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-19.1.004
DOS/360 OPTIMUM BOND BIDDING CONVERSION OF 360A-FI-06X

AUTHOR: Susan B. Brand

DIRECT TECHNICAL INQUIRIES TO:
Susan B. Brand
IBM Corporation
Two Broadway
New York, New York 10004

*** N - - - - - - - - - ***

DESCRIPTION - DOS/360 OPTIMUM BOND BIDDING is a conversion of the Type II program 360A-FI-06X to operate under the S/360 Disk Operating System. The intent is to place the application program in an environment whereby the user can benefit from the capabilities of DOS.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires DOS/360.

MINIMUM SYSTEM REQUIREMENTS - 32K Model 25 or above, Decimal Arithmetic, one 2311 Disk File, one card reader/punch, one printer of 120 or more print positions.

BASIC PROGRAM PACKAGE
DOCUMENTATION - IBM S/360 Principles of Operation (A22-6821), IBM DOS/360 Supervisor and T/O Macros (C24-5037), IBM DOS/360 Assembler Language (C24-3414), IBM DOS/360 Operating Guide (C24-5022), IBM DOS-TOS/360 Utility Programs - Specification (C24-3465), IBM S/360 DOS, System Control, and System Service Programs (C24-5036).
These manuals must be available for this program and should be obtained through your local IBM Branch Offic from the IBM Distribution Center, in Mechanicsburg, Pa
MACHINE READABLE - Appropriate Material Delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D191004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-19.3.001
SALES/ASSESSMENT RATIO ANALYSIS PROGRAM

AUTHOR: J. R. Vincent

DIRECT TECHNICAL INQUIRIES TO:
J. R. Vincent
Conn. St. Employee's Association
760 Capital Avenue
Hartford, Conn. 06106

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DESCRIPTION - The Sales/Assessment Ratio Program computes and prints the average ratio, average deviation, an index of assessment inequality and the number of sales by local district and type of sales by town.

PROGRAMMING SYSTEMS - Written in 360 OS FORTRAN IV G, it is designed for use by both county and state assessors. The FORTRAN source deck generates a stand alone main program.

MINIMUM SYSTEM REQUIREMENTS - The program compiles and executes on any 360 system with 42K bytes of available core, any card reader and printer with at least 120 print positions. Smaller configurations can be accommodated by reducing the number of sales below 200.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D193001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-19.4.001
INDUSTRY - BANKING, S/360 TRANSIT DISTRIBUTION

AUTHOR: Mr. W. R. Bolger

DIRECT TECHNICAL INQUIRIES TO:
Mr. W. R. Bolger
IBM Corporation
1011 San Jacinto Street
Austin, Texas

*** N - - - - - - - - - ***

DESCRIPTION - Three programs for the distribution of transit items. Output consists of batch proof list, cash letters, and recaps, all on the full page printer. Batch slips and dividers are the only control documents. Easy conversion from an all proof department operation. Balancing and control procedures are basically the same. Sort patterns are flexible, and can be added or modified by non-computer personnel. The programs can be assembled on a standard 8K BOS configuration.

PROGRAMMING SYSTEMS - The source language is BAL under 8K BOS Level 8, with 1419 IOCP Supervisor.

MINIMUM SYSTEM REQUIREMENTS - Program execution requires at least a S/360 Model 30 or 40, 16K, with Decimal feature and one selector channel, one 1419, with Fixed or Variable Length Process Control or Account No. feature, two 2311's, one 2540, one 1052, one 1403 (no selective tape lister required).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D194001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-19.5.007
PROPERTY ACCOUNTING PROGRAMS FOR HOSPITALS

AUTHOR: D. R. Statham

DIRECT TECHNICAL INQUIRIES TO:
D. R. Statham
c/o Carraway Methodist Hospital
1615 N. 25th St.
Birmingham, Alabama 35234

*** N - - 19.0 25.3 - - - - - ***

DESCRIPTION - A set of 3 Assembler Language programs designed to provide a monthly system of adding to, deleting from, and depreciating the capital assets of a hospital. To effect the addition and deletion of records in a minimum amount of time, the Index Sequential File Organization System is used for the master file. For a multi-hospital system, the ability is provided to change report headings via program control cards. The option to put the monthly report on tape for spooling is also available. If reassembly is necessary, the user must have cataloged in his Source Statement Library the 16K General Purpose Macros or add his own code in the program where the 'IFONB' macro from this set is used.

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PROGRAMMING SYSTEMS - Written in DOS Assembler Language and operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - A 32K Model 30 with Decimal Arithmetic, 3 2311 Disk Drives, 1 1403 Printer, a 2540 Card Reader, and a 1052 Console Typewriter.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360D195007

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-19.5.008 *M
MVT ACCOUNTING ROUTINE (MVTACTRT)

AUTHOR: S. Nemeth

DIRECT TECHNICAL INQUIRIES TO:
S. Nemeth
Martin Marietta Corporation
Orlando, Florida 32805

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DESCRIPTION - In order to accomplish the most efficient utilization of the installed hardware under the Operating System in MVT environment, a classification of the existing jobs will become importunate. To classify and schedule jobs, it is pertinent to have knowledge of their maximum core, tape, disk and execution time requirements. The MVT Accounting Routine, "IEFACTRT", is designed to collect this pertinent information about jobs and job steps executed under the Operating System in MVT environment. As a component of the "Scheduler", it edits user accounting data specified on the "Job Card" and will fail the job if accounting data does not meet user's requirements. The routine will create and write a set of two accounting records on the system "LOG" for each job executed containing the following information: User's Accounting Data, Job and Programmer Identification, Job Start and Stop Times, Elapsed Time, Job CPU Time, Estimated Time, Hi Water Mark, Region Size, Maximum Tape and Disk Usage, Completion Code, Initiator Indicator and Priority, Step CPU Time Distribution, and Computer Identification. Also, "IEFACTRT" prints most of the above information on the SYSOUT, displays tape mounting requirements and completion code of each job step on the console. Two resident (Type II) SVC routines, namely "IGC247" and IGC251" are established as part of the accounting package to count tape and disk usage, display tape mountings and to control the storage of accounting information respectively. The installation of these SVC routines will increase the nucleus by 3936 bytes. The Accounting Routine will add 3182 bytes to the sizes of "IEFSD061" and "IEFW21SD" modules. "IGC251" provides storage for accounting information of sixteen simultaneously running jobs.

PROGRAMMING SYSTEMS - Written in Assembler language F.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D195008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-19.7.001
OFF-LINE PROCESSING FOR AN ON-LINE SAVINGS SYSTEM

AUTHOR: Mr. R. S. Dangelo

DIRECT TECHNICAL INQUIRIES TO:
Mr. R. S. Dangelo
IBM Corporation
2 Broadway
New York, New York

*** N - - - - - - - - - ***

DESCRIPTION - This savings accounting package is designed to assist users with 3-drive S/360 systems with the installation of off-line processing necessary to support

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an on-line saving application. The update program is written to do either of the two most common methods for interest calculations- (1) day of deposit to end of period, or (2) "nth day of the month". The programs are written to run under control of BOS; any utility programs referred to in the accompanying guide are resident on the BOS Systems Pack.

PROGRAMMING SYSTEMS - Uses utility control cards and requires BOS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 20 or 30, 16K, Commercial Set, 2 I/O Channels (1 selector - 1 multiplexor) 1 printer (1403, 1443), 1 reader-punch (2540, 1442, etc.), 1 console typewriter, 3 2311 Disk Drives, 1 2841 File Storage Control Unit.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-19.7.002
ERCOF OF DEPOSIT TRANSIT

AUTHOR: Dennis A. Fast

DIRECT TECHNICAL INQUIRIES TO:
Dennis A. Fast
IBM Corporation
2125 Biscayne Blvd.
Miami, Fla.

*** N - - - - - - - - - - ***

DESCRIPTION - A set of six programs to perform a banks proof of deposit transit function. Features - independent changeable sort patterns, tracers, dividers, and destination headers; full page approach; provides deposits; writes batch proof list; automatically writes cash letters at end of a pass; on-us capture, including float and item count; remittance advices (cash letter recaps); creates and updates end point master files; maintains end point analysis data.

PROGRAMMING SYSTEMS - The source language is BAL under 8K BCS Level 8, with 1419 IOCP Supervisor.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 30 or 40, 32K, with Decimal feature and one selector channel; one 1419, with Fixed or Variable Length Process Control or Account No. feature, and Routing and Transit Field Dash Transmission feature; two 2311's; one 2540; one 1052; one 1403 (no selective tape lister required). The programs can be compiled on a standard 8K BCS configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-19.7.003 *M
SYSTEM/360 DEMAND DEPOSIT ACCOUNTING UNDER DOS

AUTHOR: I. D. Baird

DIRECT TECHNICAL INQUIRIES TO:
I. D. Baird
IBM Corporation
2911 Cedar Springs Road
Dallas, Texas 75219

*** N - - 03.5 - - - - - - ***

DESCRIPTION - This program is a modification of the Type II program "System/360 Demand Deposit Accounting (360A-FB-15X)". The program is adaptable by commercial banks to accomplish demand deposit accounting in either a single or multibank environment. It contains all functions of the Type II program with the following exceptions -

- Analysis Processing
- 1401-1440 File Conversion
- MICR Document Processing
- Multiple Statements for a Single Account.

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The program should be useful in those installations desiring to use the demand deposit package but who have specific requirements for use of DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 32K Model 30, 3-2311 Disk Drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-19.7.008
DOS PROOF OF DEPOSIT TRANSMIT

AUTHOR: D. A. Fast

DIRECT TECHNICAL INQUIRIES TO:
D. A. Fast
IBM Corp.
2125 Biscayne Blvd.
Miami, Fla. 33137

*** N - - - - - - - - - - ***

DESCRIPTION - This set of programs is an expanded version of the S/360 Proof of Deposit Transmit programs, number 360D-19.7.002. It will operate in a multiprogramming environment with one reader/sorter, one printer and one disk per partition (maximum of 3 partitions under current version of DOS).

FEATURES - Multibank capability with float analysis by account and bank, full page approach, non-stop reader/sorter processing with divider slips for triggering bundle totals, pass to pass control, destination headers for efficient sorting of high number of endpoints, dda transaction capturing selective by bank with deposit analysis, automatic cash letters and selective multiple copy recaps, endpoint analysis, sort pattern generator and all file create programs needed for operation.

PROGRAMMING SYSTEMS - Source language is written in Basic Assembler Language and operates under S/360 DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 32K Model 25, decimal feature, one selector channel, 1419, 1403, 2-2311's, 2540 (2540 not used during transit operation) and 1052 console.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197008

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-19.7.010
PROOF OF DEPOSIT ENTRY RUN WITH TRANSIT DISTRIBUTION

AUTHOR: D. R. Davis

DIRECT TECHNICAL INQUIRIES TO:
D. R. Davis
IBM Corporation
One Maritime Plaza, Suite 200
San Francisco, California 94111

*** N - - - - - - - - - ***

DESCRIPTION - This is a generalized MICR capture and control system designed to provide a bank with a flexible means of producing proof of deposit, transit distribution, cash letters, float analysis, batch proof, and transactions capture. The program supports multi-bank processing and interfaces with the Demand Deposit Accounting Program, Program Order No. 360D-19.7.003. To implement the program the user completes a set of decision tables. The design and use of these tables provide a simplified approach to the initial definition and subsequent maintenance of the application. These tables are used to uniquely identify each document and thus to determine its proper processing and distribution pattern. The program accepts both MICR documents and punched cards as input. Printed output consists of batch lists, block totals, processing recaps,

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and cash letters.

PROGRAMMING SYSTEMS - Written in DOS Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 25E, one 2311, and a 1419 or 1412. The program runs under 10K DOS with MICR support.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197010

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-19.7.011 *M
PERSONAL TRUST ACCOUNTING PACKAGE TO ASSIST USERS IN INSTALLING OFF-LINE PROCESSING

AUTHOR: J. G. Frans

DIRECT TECHNICAL INQUIRIES TO:
J. G. Frans
IBM Corporation
Los Angeles Development Ctr.
1930 Century Park West
Los Angeles, California 90067

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DESCRIPTION - The Personal Trust System is a group of DOS COBOL programs designed to perform the accounting, file maintenance and reporting functions necessary to support the Personal Trust application.
FEATURES - Designed for growth to an on-line system; a single file approach with each property detailed by tax block; complete editing of each transaction prior to posting; comprehensive reporting: Daily, weekly, monthly and by transaction request.

PROGRAMMING SYSTEMS - Written in DOS COBOL; operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - A S/360 Model 40 with 131K of storage, a 2501 Card Reader/Punch, a 1403 Printer, 2-9 track tape drives, a 2314 plus the appropriate control units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197011

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-19.7.012 *N
A 2980-IV ON-LINE FINANCIAL SYSTEM

AUTHOR: J.C. Fortson

DIRECT TECHNICAL INQUIRIES TO:
R.G. Bayer
2125 Biscayne Boulevard
Miami, Florida 33137

*** N - - - - - - - - - - ***

DESCRIPTION - The 2980-IV On-Line Financial System is a set of program modules that minimizes the effort required to install 2980-IV Teller Terminals. It is an extension of the system produces in the IBM Los Angeles Financial Branch Office. The system was designed primarily for a savings and loan association, but is is easily modifiable for any financial institution.

Additional applications are readily implemented. Provision is made for easy modification and/or addition to the included code. The system is supplied in the form of Source Statement Library books, and DOS JCL streams to assemble and linkage edit them. A special off-line program is included to format the control and master files.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D197012

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
	none	DTR 9/800	28	none
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-22.0.001
STUDENT SCHEDULING SYSTEM/360, OS VERSION, INCLUDING TALLY AND CONFLICT MATRIX PROGRAMS

AUTHOR: A. Levinstone

DIRECT TECHNICAL INQUIRIES TO:
A. Levinstone
Stevens Institute of Technology
Computer Center
Hoboken, N. J. 07030

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DESCRIPTION - Student Scheduling System/360, OS version programs produce aids to master schedule building (Tally and Conflict Matrix) and, using a master schedule prepared by the school, process student course requests to create student schedules and an updated master schedule. The OS Sort is utilized to sort the schedule records into class list sequence.

This package represents a conversion of the IBM Type II Student Scheduling System/360 packages (Tally and Conflict Matrix, Program No. 360A-US-06X and the Scheduler, Program No. 360A-US-07X) which operate under BOS or CS. Many installations now operate in an OS environment. This conversion allows users to maintain only one operating system and still use the Student Scheduling application package.

PROGRAMMING SYSTEMS - Written in Assembler Language and runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40 with 128K core storage, and three 2311 Disk Drives.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D220001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-23.1.003 *M
TWO-STAGE, TWO-DIMENSIONAL TRIM PROGRAM II

AUTHOR: Carol E. Shanesy

DIRECT TECHNICAL INQUIRIES TO:
Carol E. Shanesy
IBM Research
Box 218
Yorktown Heights, New York 10598

*** S PK TR2DR 15.0 25.0 - - - - - ***

DESCRIPTION - Two-Stage, Two-Dimensional Trim Program II provides a linear programming solution to the two-stage two-dimensional trim or cutting stock problem. This problem can be described briefly as follows. We have a supply of material which is stocked (or produced) in one or more fixed rectangular sizes, each size having a fixed cost per unit associated with it. We also have a list of smaller rectangle sizes together with the numbers desired of each size, which are to be produced by cutting up stock-size rectangles. If any of these rectangle sizes (w x l) may be cut either w or l or l x w, the program will take advantage of this freedom. The stock-size rectangles are cut in two stages--first the rectangle is slit into strips with straight cuts parallel to the length edge, and then each strip is cut individually in the perpendicular direction. The cheapest way of cutting up stock to fill the orders must be determined. The program will handle up to 10 stock sizes and 50 order sizes, as presently compiled.

PROGRAMMING SYSTEMS - An independent routine written in FORTRAN.

MINIMUM SYSTEM REQUIREMENTS - Same at those required for OS/360, and uses 100,000 bytes of memory.

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BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D231003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-23.3.005 *M
MANUFACTURING RECORD PROCESSOR (MRP) FOR IBM OPERATING SYSTEM/360

AUTHOR: W. J. Spicer R. W. Bong
M. K. Fullerton M. Hoessle
J. Renggli

DIRECT TECHNICAL INQUIRIES TO:
W. J. Spicer
IBM Corp.
7700 Second Ave.
Detroit, Mich.

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DESCRIPTION - Manufacturing Records Processor can speed up and help optimize production and inventory planning in many manufacturing and service organizations. It does this by creating and reading up to four different files on DASD. These files are parts master, product structure, operations routing, and workcenter master; they are arranged so that any change need be made to only one file, thus obviating the possibility of unwanted different change levels existing at one time. Full flexibility is available by allowing for code, easily-written by the user, to be incorporated. This could permit several engineering change levels or alternate production facilities to exist at one time for any part or assembly. Manufacturing Records Processor is a set of generalized programs and macros which enables the user to design, build, and execute his own programs under IBM/360 OS.

The manufacturing records processor is an adaptation of the Bill of Material Processor Version II operating under BOS/DOS (360A-ME-06X).

PROGRAMMING SYSTEMS - Written in OS Assembler F Source Language and runs under OS/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 and up with Decimal Arithmetic, 65K or 128K depending on features used, one disk drive in addition to one or two required for resident OS, printer, card read/punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D233005

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-23.3.006
BILL PROCESSOR INTERFACE MACRO AND CHASE SUBROUTINE FOR USE WITH PL/I-SUBSET RETRIEVAL PROGRAMS

AUTHOR: E. C. Ingram

DIRECT TECHNICAL INQUIRIES TO:
E. C. Ingram
Le Blond Machine Tool Co.
Madison & Edwards Rds.
Cincinnati, Ohio 45208

*** C 3364 - - - - - - - - ***

DESCRIPTION - PL$CH and PL$BM are two programs which are used to allow PL/I-subset programs to retrieve bill of material processor files.

PL$BM is a macro, similar to the IBM supplied CB$BM macro for COBOL users, which must be assembled to create an interface module between the PL/I program and the BMP I/O modules. It has all the features of the CB$BM macro.

PL$CH is a re-entrant coded subroutine designed to perform the chase function for PL/I-subset programs. This program is not a macro, as is PL$BM and the CB$BM (and CB$CH), and it needs to be assembled only once. PL$CH will retrieve any BMP chain file records and (if desired) their subordinate master records. Having been coded re-entrant, the module will perform a chase to any level desired without

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any special tailoring or re-compiling.

PROGRAMMING SYSTEMS - Written in Assembler Language and runs under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - A 32K processing unit with Decimal Arithmetic, 1052 Printer-Keyboard, 2841 Storage Control, 2311 Disk Storage Drives as required to contain DOS and user files.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D233006

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-23.4.001
SYSTEM/360 AUTOPROPS NUMERICAL CONTROL PROGRAM

AUTHOR: E. H. Pereira

DIRECT TECHNICAL INQUIRIES TO:
E. H. Pereira
IBM Corp.
5 Place Ville Marie
Montreal, P. Q., Canada

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DESCRIPTION - System/360 Autoprops is a conversion of normal mode operation in 1401 Autoprops II (1401-CN-03X). Data cards are read in only once and stored on tape. Tape is rerun for each tool mode. A hard copy listing is produced as well as output to a specified data set (card punch or tape) of coordinates for input to a post-processor.

PROGRAMMING SYSTEMS - Written in FORTRAN and runs under DOS/TOS.

MINIMUM SYSTEM REQUIREMENTS - Model 30 - 32K, card reader, printer, 2 tape drives or 1 tape and card punch.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D234001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-23.4.002 *M
NUMERICAL CONTROL GRAPHICS

AUTHOR: L. L. English E. J. Bland
L. A. Senneville R. J. Finn
J. M. Heligman

DIRECT TECHNICAL INQUIRIES TO:
J. J. Emashowski
IBM Corporation
1930 Century Park West
Los Angeles, California 90067

*** N - - 00.6 - - - - - - ***

DESCRIPTION - The program provides the capabilities to construct, modify, and delete geometric elements. It provides for the formation of groups of geometric elements and calls upon the Numerical Control Processor to create a cutter location (C/L) tape output which can be translated to meet the requirements of a specific milling machine. Techniques are also provided to create or modify datasets, file and retrieve data, move, scale and rotate the picture displayed on the 2250 screen. This program will assist graphics users to: Improve turnaround time, make corrections and modifications on-line, implement other graphics activities by having a geometric base and data structure upon which to build.

PROGRAMMING SYSTEMS - This is a graphics program to be run under OS/360, written in FORTRAN IV using GSP.

MINIMUM SYSTEM REQUIREMENTS - A 360/40 with 262K bytes, one 2250 Display Unit with all features, one 2260 Display Unit (optional), and one direct access device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.

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MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D234002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-23.4.003 *N
GRAPHIC PART PROGRAMMER

AUTHOR: T.E. Buttry

DIRECT TECHNICAL INQUIRIES TO:
T.E. Buttry
McDonnell - Douglas Corp.
St. Louis, Missouri

*** N - 0001A 00.6 16.0 - - - - - ***

DESCRIPTION - The Graphic Part Programmer is a graphics program which provides the capabilities to construct, modify and delete geometric elements. It provides for the formation of groups of geometric elements and calls upon the numerical control processor to create a cutter location (C/L) tape output which can be translated to meet the requirements of a specific milling machine. Techniques are also provided to modify the CL data set, file and retrieve data, move, scale and rotate the picture displayed on the 2250 screen. This program will assist graphics users to: improve turn-around time, make corrections and modifications on line, implement other graphic activities by having a geometric base and data structure upon which to build.

PROGRAMMING SYSTEMS - Runs under OS/360, written in FORTRAN IV using GSP.

MINIMUM SYSTEM REQUIREMENTS - A 360/40 with 262K bytes, one 2250 Display Unit with all features, and one direct access device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D234003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	COE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-25.0.004
EQUIPMENT ORDER, SHIPMENT, INSTALLATION, AND DISCONTINUANCE REPORT FOR LARGE ACCOUNTS

AUTHOR: H. E. Cotter

DIRECT TECHNICAL INQUIRIES TO:
H. E. Cotter
IBM Corporation
33 North Dearborn
Chicago, Illinois 60602

*** N - - 195 285 260 270 - - - ***

DESCRIPTION - A general purpose program to produce a variable, 24 month, graphic representation of on-order and installed equipment. This program is useful (particularly for large accounts) to both IBM representatives and customers to tell at a glance what equipment is scheduled to be shipped, installed, or removed at different physical locations. Three levels of totals are maintained for the 24 month period under consideration at any particular execution. These are (1) Totals for each physical location (2) Totals for each logical grouping of locations (3) Grand totals for all locations. Input is based on a simple detail card with default values available wherever possible.

PROGRAMMING SYSTEMS - Written in CS/PL/I showing examples of various PL/I coding techniques. Tested under Release 15/16 of the Operating System using Version IV.

MINIMUM SYSTEM REQUIREMENTS - An OS/360 of PL/I 64K execution, region or partition.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

CONTINUED FROM PRIOR COLUMN

ORDERING INFORMATION: PROGRAM NUMBER 360D250004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/900	26	none
OPTIONAL	none	none		none

360D-25.2.002 *N
MODIFICATION OF S/360 WHOLESALE IMPACT LIBRARY FOR USE WITH A 16K - 4 TAPE S/360

AUTHOR: R. S. Yates

DIRECT TECHNICAL INQUIRIES TO:
R. S. Yates
IBM Corp.
2830 Victory Parkway
Cincinnati, Ohio

*** N - - 15.7 - - - - - - ***

DESCRIPTION - These programs are modifications to two of the programs in the System/360 Wholesale IMPACT Computer Library (360A-DW-05X). The IMPACT program library provides a user with programs that enable him to establish an inventory strategy which minimizes inventory costs at any preselected service level. Current machine requirements for use of these programs are a minimum of 16K storage and at least one 2311 Disk Drive. The modified programs are SVA and AP, two of the most frequently used programs in the IMPACT library. The changes in these programs will allow a user with a minimum of 16K storage and four tape drives to use them. With these modified programs, the tape-oriented user will be able to benefit from these application programs.

PROGRAMMING SYSTEMS - Written in BPS Assembler Language for execution with 8K BPS Basic Programming Support System.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 30 with 16K storage and 4 tape units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D252002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360D-25.2.004 *N
UNIT CONTROL SYSTEM FOR RETAILERS

AUTHORS: J. Bates W. D. Valentine

DIRECT TECHNICAL INQUIRIES TO:
J. Bates
3424 Wilshire Blvd.
Los Angeles, Calif. 90005

*** N - - 23.4 23.5 - - - - - ***

DESCRIPTION - A complete set of System/360 programs is provided for the small to medium size retailer to collect and maintain sales and on-hand information. After the transaction (sales and receipts of merchandise, merchandise transfers, returns to vendors, inventory adjustments, etc.), they are machine-edited and checked for validity, written on a disk file, and sorted into sequence. The master records contain sales and on-hand information to the department, class, price, resource, style, and color/size level. The updated records are processed at appropriate intervals to prepare reports for the buyers and merchandise management. The reports supplant the information previously available in the style black books, and provide additional exception and analysis information.

PROGRAMMING SYSTEMS - Written in Assembly Language and run under the Basic Operating System (BOS).

MINIMUM SYSTEM REQUIREMENTS - Model 25 with 2 disk drives and 16K storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D252004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT

CONTINUED FROM PRIOR PAGE

	EXTENSION	TYPE	CODE	REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-29.3.002 *N

VSP SCHEDULE PRODUCTION FOR O/S 360

AUTHOR: W. S. Frantz

DIRECT TECHNICAL INQUIRIES TO:
W. S. Frantz
Safeway Stores, Inc.
7200 Edgewater Dr.
Oakland, Calif.

*** N - - 15.4 23.1 27.4 - - - - ***

DESCRIPTION - This program is an adaptation of the "Schedule Production Program" portion of the IBM Type II Vehicle Scheduling Program (360A-ST-06X, V1M0 to OS/360. The changes to the DOS version are: Input/Output Macros... Timing Services...Storage Allocation. The OS version has been assembled and tested on a S/360 Model 50 with a 2314 under OS release 15/16 MVT in a 60K region. The Flowcharts and other documentation distributed with the Type II Application Package are still valid since no logic changes have been made. The Basic Program Documentation and Optional Program Package available for the Type II Vehicle Scheduling Program provide documentation needed by the user of this OS adaptation.

PROGRAMMING SYSTEMS - Operates under OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required to run OS/360 Assembler plus ISAM.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D293002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-29.4.001

TEXT360

AUTHOR: S. I. Reed

DIRECT TECHNICAL INQUIRIES TO:
W.J. LeSuer
IBM Corp.
112 E. Post Rd.
White Plains, N. Y. 10601

*** N - - - - - - - - - - ***

DESCRIPTION - TEXT360 is a Text-Processing System with data-entry, data-updating, and page-formatting capabilities. The system, which runs under OS/360, consists of a main processor and several peripheral programs. Input to the system is free form and is produced on the IBM 029 Card Punch. Output is camera-ready and is produced on the 1403 Printer. Text360/S updating capabilities permit the insertion, deletion, and replacement of characters, words, lines, and groups of lines. In addition, blocks of text may be moved from one place to another in a document. Text360's formatting capabilities permit either one-column or two-column pages. Routine functions include hyphenation, line justification, column leading, and indentions. More complex functions include the generation of horizontal and vertical rules for tables and figures. The program also permits keeping related material (e.g., a table) together, i.e., not splitting it from one column or page to another.

PROGRAMMING SYSTEMS - The source language is Pl/I, augmented by two Assembly Language subroutines.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40 (128K and Universal Instruction Set), 1052 Console, card read/punch, 1403 Printer (Universal Character Set and 120-Character Chain/Train), 2311 Disk Storage Drive, 2400 Magnetic Tape Units.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D294001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-29.4.002

A PROGRAM FOR EMPTY FREIGHT CAR ALLOCATION

AUTHOR: W. W. White

DIRECT TECHNICAL INQUIRIES TO:
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New York Scientific Center
590 Madison Ave.
New York, N. Y. 10022

*** N - - - - - - - - - - ***

DESCRIPTION - Given forcasted demands for empty freight cars of a specified type at various locations at various times on a railroad, and similarly forecasted availabilities, this program solves the problem of allocating empties to the demand locations by the time they are needed, or as soon after as possible, so as to minimize the cost of moving the cars. Input is in terms of stations, train schedules, costs, and demands and availabilities. The program converts this data into a transshipment network, and uses a special network flow algorithm to solve it. Output is in terms of the necessary car movements at the various yards and on the various trains. Upper and lower bounds on train lengths are permitted. More rudimentary applications of other scheduling techniques have already resulted in significant savings to the users.

PROGRAMMING SYSTEMS - This program is written in PL/I.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 50, 256K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D294002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-29.4.003

ADMINISTRATIVE TERMINAL SYSTEM OFFLINE FORMAT AND PRINT PROGRAM - OLPRT/360

AUTHORS: W. W. Dement M. W. Fritz
K. R. Pearson

DIRECT TECHNICAL INQUIRIES TO:
W. W. Dement
IBM Corp.
1330 Summit Ave.
Ft. Worth, Texas 76102

*** N - - 06.8 12.1 - - - - - ***

DESCRIPTION - This program formats and prints backup, archives, or queue tapes from the 1440/1460 Administrative Terminal System (1440-CX-07X and 1460-CX-08X). ATS terminal operators must enter a "Page Zero" which defines the format of following documents. The program provides increased printing speed and additional formatting facilities over those provided in the ATS 1400 series on-line system.

PROGRAMMING SYSTEMS - Written in Assembler Language and the operating system required is DOS.

MINIMUM SYSTEM REQUIREMENTS - S/360 with 22K in addition to the core requirements of DOS, one 7-track drive, 1403 Printer and UCS feature and TN Train, and a 1052 Console Typewriter. A 9-track drive is required initially to offload the program tape.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D294003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-29.4.004
INDEX PREPARATION FOR PUBLICATIONS INDUSTRY

AUTHOR: J. F. Kray

DIRECT TECHNICAL INQUIRIES TO:
J. F. Kray
IBM Corporation
Dept. 188 P.O. Box 6
Endicott, New York 13760

*** N - - 06.8 12.1 - - - - - ***

DESCRIPTION - This program produces an index in double-column format which is suitable for reproduction by photo offset printing. The program would be of value to any publication department that has to prepare indexes as a part of its publications. Once the index entries are punched into cards and sorted (using standard utility sort programs) this program will produce an index with both upper and lower case characters. Most of the clerical tasks associated with index preparation or revision have been eliminated or greatly reduced by the use of this program.

PROGRAMMING SYSTEMS - Programming language - PL/I. Operating system required - OS/360.

MINIMUM SYSTEM REQUIREMENTS - Any System/360 equipped with a printer that has the Universal Character Set feature. A TN-train or the equivalent must be mounted on the printer to produce the index in upper and lower case characters.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D294004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-30.1.001
DEMONSTRATION INFORMATION SYSTEM

AUTHORS: J. R. Ridgley L. W. R. Brown
J. P. McAvoy C. A. Stringfellow
L. F. Trafton M. V. Wyer

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corp.
Dept. 995, Bldg. 001
P. O. Box 12195
Research Triangle Park, N. C.

*** N - - 30.2 - - - - - - ***

DESCRIPTION - The Demonstration Information System (DIS) is designed to demonstrate the functions and capabilities of IBM terminals operating on line with System/360 under the control of DOS/QTAM in a multi-programming environment.

Separate applications are provided for each of the terminal devices supported as follows-

- 1030 receiving and production reporting
- 1050 inquiry on stock status and accounts receivable, order entry, shipping confirmation
- 2260 sales analysis
- 2740 conversaticnal entry in purchasing environment
- 2780 order entry and invoicing (using BTAM).

TP terminals supported by DIS are the following:
1030 DATA COLLECTION SYSTEM - 1031-A4 Input Station or 1031-A5... 1279 1033 Printer Attachment... 1033-1 Printer... 9575 Standard Printing Element...

1050 DATA COMMUNICATIONS SYSTEM - 1051-1 Control Unit... 4408 First Printer Attachment... 4410 First Punch Attachment... 4411 First Reader Attachment... 6384 Second Reader Attachment... 4770 Keyboard Request... 4795 Line Correction... 5465 Open Line Detection... 4605 Home Component Recognition... 9114 Data Set Attachment-WE 103A... 1052-1 Printer-Keyboard... 5465 Open Line Detection... 1054-1 Paper Tape Reader... 1055-1 Paper Tape Punch... 1056-1 Card Reader...

2260 Visual Display - 2260-2 Display Station... 4760 Alphanumeric Keyboard... 2260 Visual Display - Local - 2260-2 Display Station... 4766 Keyboard, Alphanumeric... 1053-4 Printer... 1006 Accelerated Carrier Return... 9104 Character Spacing 10/inch... 9354 Line Space 6 LPI holes 8... 9435 Line Feeding, 6 lines/inch... 9509 Pin Feed Plater, Regular... 9571 Dual Case PR EL-S/360... 2848-2 Display Control... 3356 Display Adapter for Model 2... 3858 Expansion Unit-Models 1, 2... 4787 Line Addressing... 5340 Non-Destructive Cursor... 5341 Non-Destructive Cursor Adapter... 7927 1053 Adapter for Model 1, 2... 9011 Channel Adapter... 2848-1 Display Control... 3356 Display Adapter

CONTINUED FROM PRIOR COLUMN

for Model 2... 4787 Line Addressing... 9012 Data Set Adapter - 1200 BPS...

2740 COMMUNICATIONS TERMINAL - 2740-1 Communications Terminal... 3255 Dial-Up... 6114 Record Checking... 8028 Transmit Control... 9114 Data Set Attachment-WE 103A...

2780 DATA TRANSMISSION TERMINAL - 2780-2 Data Transmission Terminal... 1340 Automatic Answering... 1350 Automatic Turnaround... 5010 Multiple Record Transmission... 5800 Printer Horizontal Format Control... 5820 Print Line for 120-characters... 5821 Print Line for 144-characters... 6400 Selective Character Set... 9098 47 Characters Set for 6 bit Transmission... 9110 Data Set ATT-WE 201A3... 9710 for Commun. W. Processor System... 9760 Transmission Code-6 bit Transmission.

PROGRAMMING SYSTEMS - Source - Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - DIS requires a S/360 Model 30, 64K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D301001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-30.1.002
360/2260 FUNCTIONAL DEMONSTRATION IN DOS F1 PARTITION - BTAM LOCAL

AUTHOR: Nancy E. Postma

DIRECT TECHNICAL INQUIRIES TO:
Nancy E. Postma
IBM Corporation - Chicago Datacenter
80 East Lake Street
Chicago, Illinois 60601

*** N - - 00.6 - - - - - - ***

DESCRIPTION - An operator chooses, then displays some file on 2260, 12 lines at a time. With "page" command he can flip back and forth through the file. With "replace" command he can alter file record displayed by typing changes. Files are actually in core and are pre-read from sample cards supplied with program or personalized data provided by the user. Supplied samples include descriptive displays, bar charts, graphs, simulated order entry and file maintenance.

PROGRAMMING SYSTEMS - Available in assembler source (requires BTAM mod.) and is designed to operate in 66K Foreground 1 partition, of which 48K is data.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 40 with 128K and DOS multi-programming support features, 1-2260 Display Station-Model 1, 1-2848 Display Control Unit-Model 3, one 9 track tape drive may be substituted for the 2540 Card Reader at program execution time. Program may be easily modified to use 2260 Model 2 and thus decrease core requirements.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE _ Source code and data display file.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D301002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-30.2.001
SYSTEM/360 1030 DATA COLLECTION SYSTEM DEMONSTRATION SYSTEM

AUTHORS: J. H. Williams E. M. Milt

DIRECT TECHNICAL INQUIRIES TO:
J. H. Williams
IBM Corp.
2925 Euclid Ave.
Cleveland, Ohio 44115

*** N - - 23.2 23.5 30.1 - - - - ***

DESCRIPTION - This 1030 Data Collection System Demonstration consists of a set of programs which were developed to provide a means for demonstrating the on-line capabilities

CONTINUED FROM PRIOR PAGE

of the IBM 1030 Data Collection System and to serve as a guideline for the programming required to implement such a system. The demonstration is designed to illustrate job accounting for a factory environment. It includes functions such as job assignment, order status, inquiry, job scheduling and reporting, and update of direct access files. A sample demonstration is included to facilitate use of these programs which have been tested under DOS Releases 13, 14, and 15.

PROGRAMMING SYSTEMS - The package consists of two COBOL programs and two Assembler Language ETAM programs.

MINIMUM SYSTEM REQUIREMENTS - The demonstration program requires- 65K - System 360 Model 30, 1052 Console, 2540 Card Reader, 1403 Printer, 2311 Disk Drive - DOS SYSRES, plus 8 cylinders for data files, 2701 with type 2 Terminal Adapter No. 4648 and Line Adapter No. 4637, 1031 with card(badge)manual input and 1033 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D302001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-30.2.002 *M
SHARED HOSPITAL ACCOUNTING SYSTEM (SHAS) DEMONSTRATION PACKAGE

AUTHORS: Mrs. Martha E. Frye W. Stewart

DIRECT TECHNICAL INQUIRIES TO:
W. Stewart
IBM Corporation
112 E. Post Road
White Plains, New York

*** N - - 19.0 28.3 29.0 30.1 - - - ***

DESCRIPTION - This is a package to demonstrate the features and capabilities of the Shared Hospital Accounting System. SHAS (360A-UH-11X) is an IBM package of over 130 programs. These programs cover three application areas - patient billing, accounts receivable and general ledger. During this demonstration reports are produced from pre-established master files. These files contain typical hospital data, thus, the reports rendered are quite meaningful. The initiation of whole series of job steps by the use of function initiator cards is shown. The report selection feature is displayed, showing how the contents of reports may be altered by the user. The observer participates in the use of the hospital profile, by having the hospital name and address of his choice printed on all of the reports. Other report selections and profile options may be made by the user demonstrating the power of SHAS adaptability. The report format control (RFC) capability is also displayed by the nursing comments report showing how each user on the system can change the format of the reports to one suitable for him.

PROGRAMMING SYSTEMS - Operates under DOS/360.

MINIMUM SYSTEM REQUIREMENTS - A 360 Model 25 or higher, a 1442 or 2540 Card Reader, 2 nine track tape drives and a 2311 Disk Drive. A second disk drive is required, with a DOS pack, in order to restore the demonstration pack.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D302002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 9/800	28	01
		MT 9/1600	29	01
		MT 7DC/800	26	01
OPTIONAL	none	none		none

360D-40.0.001
DFACT - DOUBLE PRECISION FACTORIAL

AUTHOR: H. E. Schaffer

DIRECT TECHNICAL INQUIRIES TO:
H. E. Schaffer
North Carolina State University
Dept. of Genetics
Raleigh, N. C. 27607

CONTINUED FROM PRIOR COLUMN

*** S NCS - 13.0 41.0 - - - - - ***

DESCRIPTION - This subroutine returns the double precision value of factorial N. For negative N, the absolute value of N is used and an error indication is returned. For N greater than 56 the maximum floating point value is returned and an error indication is returned. (Factorial 56 is the largest factorial value which can be represented in a floating point word).

This subroutine is very fast since the factorial values are found by a table look up. The tabular values were generated exactly in hexadecimal arithmetic and rounded to double precision length. The accuracy of these hexadecimal tabular values is thus the maximum possible in a double precision word, and is not affected by any inaccuracy in the conversion of decimal constants to hexadecimal.

PROGRAMMING SYSTEMS - This subroutine is written in FORTRAN IV.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 with FORTRAN IV (G or H level), and uses approximately 1,000 bytes of core at object time.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D400001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-40.0.002 *N
INTEGER MULTIPLE PRECISION SUBROUTINE PACKAGE FOR THE IBM 360

AUTHOR: H.D. Wiebe

DIRECT TECHNICAL INQUIRIES TO:
H.D. Wiebe
Dept. of Mathematics
University of Oklahoma
Norman, Oklahoma 73069

*** C 3242 - 06.5 - - - - - - - ***

DESCRIPTION - The S/360 Integer Multiple Precision Subroutine package is a group of Assembler F subroutines written to allow a FORTRAN IV program to manipulate integers arbitrary length (limited only by the available machine storage space). Integers to be manipulated by the subroutines may be stored either as regular full-word FORTRAN IV integers (for integers less than 1,000,000,000) or in pre-defined dimensioned arrays (for integers of any size). In many cases these two forms may be intermixed as input and/or output parameters for the subroutines. The subroutines are independent of specific output parameters for the subroutines. The subroutines are independent of specific output devices, but require a system set for EBCDIC code.

PROGRAMMING SYSTEMS - Written in Assembler F.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D400002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-40.1.001
SYSTEM/360 ADD, SUBTRACT, MULTIPLY, DIVIDE, SQUARE ROOT UTILITY PROGRAM

AUTHOR: W. Batten

DIRECT TECHNICAL INQUIRIES TO:
W. Batten
IBM Corp.
425 Park Ave.
New York, N. Y.

*** N - - 41.4 - - - - - - ***

DESCRIPTION - This program will perform the stated functions and immediately print out the numbers involved and the

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answers. any of the three basic subprograms can be called upon by entering a code letter on the console typewriter. The add-subtract routine performs those functions on quantities which are entered through the console typewriter. The numbers, sub-totals - if desired -, and final totals are immediately printed out on the printer. When the Multiply-Divide routine is called upon, these functions will be performed on varying length input quantities. Typing in 12345X345 immediately prints on the typewriter on the next line, 12345 X 345 EQUALS 42592320. Entering 987654321/23456 types out immediately 987654 / 23456 EQUALS 42106 RMDR 15985. When the Square Root routine is referenced, entering 967894321 types out immediately, SQUARE ROOT EQUALS 31111. Program is useful for test data calculations and as a vest-pocket demo. Consists of about 20 cards.

PROGRAMMING SYSTEMS - Program is written in machine language. All arithmetic is fixed point.

MINIMUM SYSTEM REQUIREMENTS - Any Model S/360, 2540 Card Reader, 1052 Console Typewriter, and 1403 Printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D401001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-40.2.001
DIMAG AND DREAL FUNCTIONS

AUTHOR: J. H. Fulton

DIRECT TECHNICAL INQUIRIES TO:
H. R. Hamilton
North Carolina State University
Computing Center
P. O. Box 5445
Raleigh, N. C. 27607

*** S NCS - 40.1 - - - - - - ***

DESCRIPTION - A multiple-entry function subprogram to provide functions similar to REAL and DIMAG but for Complex*16 Variables. The subprogram obeys standard OS/360 FORTRAN IV linkage conventions and requires 3A (HEX) of store. DIMAG and DREAL are two entry points in one CSECT named DREAL.

PROGRAMMING SYSTEMS - Written in Assembler Language and requires Operating System 360/OS (FORTRAN).

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D402001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-40.4.001
GETEXP AND SETEXP

AUTHOR: J. H. Fulton

DIRECT TECHNICAL INQUIRIES TO:
H. R. Hamilton
Computing Center
North Carolina State University
P. O. Box 5445
Raleigh, N. C. 27607

*** S NCS - - - - - - - - ***

DESCRIPTION - Subroutines to permit extraction and insertion of "exponents" in floating-point numbers.

PROGRAMMING SYSTEMS - The subprogram was written in OS/360 Assembler, obeys standard OS/360 FORTRAN linkage conventions and requires 68 (HEX) bytes of storage. GETEXP and SETEXP are two entry points in one CSECT called GETEXP.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

CONTINUED FROM PRIOR COLUMN

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D404001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-40.4.002
MULTI-PRECISION FLOATING-POINT ADD, SUBTRACT, MULTIPLY, DIVIDE, HALVE FOR IBM SYSTEM/360

AUTHOR: H. H. Barnett

DIRECT TECHNICAL INQUIRIES TO:
H. H. Barnett
IBM Corporation
711 Hillsborough Street
Raleigh, North Carolina 27603

*** N - - - - - - - - - ***

DESCRIPTION - The program subroutine Multiprecision Arithmetic extends the precision of the IBM system/360 floating-point operations add, subtract, multiply, divide, halve up to 30 hexadecimal digits (approximately 36 decimal digits). The form of the numbers used is long floating-point with fraction extended two more full words. Each call of this subroutine performs one operation in short, long, or multiprecision form (length). Halve is restricted to multiprecision). The operation and the length may be re-selected for each use of a particular call statement.

PROGRAMMING SYSTEMS - Programming language - Assembler Language; operating system required - DOS or OS (with FORTRAN).

MINIMUM SYSTEM REQUIREMENTS - Those required for OS or DOS. (The complete subroutine requires 4076 bytes of core storage).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D404002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-40.4.003
MULTIPLE - PRECISION FLOATING-POINT ARITHMETIC PACKAGE

AUTHOR: J. R. Ehrman

DIRECT TECHNICAL INQUIRIES TO:
J. R. Ehrman
Stanford Linear Accelerator Center
Stanford, California 94305

*** S SLA - 40.1 - - - - - - ***

DESCRIPTION - These routines provide the System/360 Programmer with a simple means for performing Floating-Point Arithmetic to any desired precision, and in a format compatible with standard System/360 Floating-Point format.

PROGRAMMING SYSTEMS - The routines are written in Assembler language, and are designed primarily for use in a FORTRAN environment. However, they may be called by any program which observes standard OS/360 parameter-passing and linkage conventions.

MINIMUM SYSTEM REQUIREMENTS - Same as those required to run OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D404003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-42.0.001
BENSON MENDELSOHN ALGORITHM FOR CERTAIN WORD PROBLEMS IN GROUPS

AUTHOR: N. W. G. Wilde

DIRECT TECHNICAL INQUIRIES TO:
Dr. N. Mendelsohn
University of Manitoba
Mathematics Dept.
Winnipeg 19, Manitoba, Canada

*** N - - 40.0 45.0 99.0 - - - - ***

DESCRIPTION - Let G be a group given by up to 128 generators and up to 32 relations. Let H be a subgroup of G generated by up to 8 words in the group generators. This program enumerates the right cosets of H. For each coset L and each group Generator X the program finds the following relationships involving cosets and a set of coset representatives-

1 * X equals K

RL * X equals W * RK where K is a coset, RL is a coset representative for L, RK a coset representative for K and W is a word in the subgroup generators. The asterisk denotes the group operation. the algorithm was originally described by Benson and Mendelsohn in "Journal of Combinatorial Theory," 1, 2, 202 (Sept. (66)).

PROGRAMMING SYSTEM - Written in Assembler Language and operates under DOS.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 having the decimal instructions and at least 20K of core. It can be easily modified for full Operating System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D420001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-42.0.002 *N
MINFUN FUNCTION MINIMIZER

AUTHOR: C.A. Crane

DIRECT TECHNICAL INQUIRIES TO:
Linda N. Lorenzetti
Stanford Linear Accelerator Center
2575 Sandhill Road
Menlo Park, California 94305

*** 1 SLA - 17.1 - - - - - - - ***

DESCRIPTION - MINFUN will minimize an arbitrary smooth function of up to 50 parameters. It has two modes of operation: The exploration mode continues to search for a global minimum after passing a local minimum; the convergence mode converges on the first local minimum it finds. In either mode the user may specifically give the initial starting point, starting direction, and forbidden regions. MINFUN is well suited for finding the parameters of complicated models of physical phenomena for which experimental data is available to fit against. The function to be minimized is provided by the user as a FUNCTION subprogram. If the function is a least- or Chi-squares sum, or the negative logarithm of the maximum likelihood function then as error analysis can be performed by MINFUN. 1500
Other options include step-by-step tracing of the search 50 steps.

PROGRAMMING SYSTEMS - Written in FORTRAN IV H and may be used either as a main program or as a subroutine.

MINIMUM SYSTEM REQUIREMENTS - MINFUN occupies 80,000 bytes of core, of which 27,900 may be used as scratch areas by other programs through COMMON. MINFUN uses long precision floating point arithmetic throughout. It has been thoroughly tested on the Models 75 and 91, System/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D420002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-42.2.001
EXPERIMENTAL PROGRAM FOR DETERMINING POLYNOMIAL ZEROS

AUTHOR: Irene Gargantini W. Munzner

DIRECT TECHNICAL INQUIRIES TO:
Irene Gargantini
IBM Corporation
Saumerstrasse 4
8803 Ruschlikon
Surich, Switzerland

*** S PK POGA - - - - - - - ***

DESCRIPTION - The program determines simultaneously all the zeros of a polynomial together with error bounds. It is possible for the user to follow how the procedure works throughout the entire program by removing the C for comment in the write statements and in the two subprograms PRINTS and PRINTD. This program is not intended to be optimal, neither with regard to programming nor to computing time. It is the first digital technique for searching all the zeros that does not use deflation and gives approximations to the zeros with a predictable degree of accuracy.

PROGRAMMING SYSTEMS - Written in FORTRAN IV; operates using OS/360.

MINIMUM SYSTEM REQUIREMENTS - A System/360 with at least 128K core storage.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D422001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-43.1.001
ANL D153S DROMB TWO-DIMENSIONAL ROMBERG QUADRATURE

AUTHOR: K. Hillstrom

DIRECT TECHNICAL INQUIRIES TO:
W. Cody
Argonne National Lab.
Applied Mathematics Div.
Argonne, Ill. 60439

*** S AN - - - - - - - - ***

DESCRIPTION - A FORTRAN-IV subroutine to evaluate the definite integral of a real function of two real variables over a rectangle. This subroutine uses an extension of the Romberg Quadrature Scheme to two dimensions. The technique has the same restrictions on efficient usage as does Romberg Quadrature in one dimension (see R. C. Thacher, Jr. "Remark of Algorithm 60", COMM. ACM 7, July, 1964, p. 420). However, this subroutine is much more efficient than calls to two one-dimensional quadrature routines when the Romberg Scheme is applicable.

PROGRAMMING SYSTEMS - Requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required by the S/360 Operating System.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D431001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-43.1.002
DSL, AN IBM 360 MODEL 44 PROGRAM FOR THE SIMULATION OF PROCESS DYNAMICS FEATURING USER-INTERACTION AND ON-LINE GRAPHICS

AUTHORS: D. G. Wyman W. M. Syn

DIRECT TECHNICAL INQUIRIES TO:
Dr. S. M. Roberts
Process Industry Dev. IBM S&ID Center
6900 Fannin St.
Houston, Texas 77025

*** N - - 12.2 16.8 15.5 43.2 - - - ***

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DESCRIPTION - DSL (Digital Simulation Language) is a FORTRAN program written for the IBM S/360 Model 44 which may be used in the simulation of process dynamics. The input language may be described as non-procedural, applications oriented, and free format. A translator converts the DSL or intermixed FORTRAN statements, expressed at the analog-block level or as a system of ordinary differential equations, to a properly sequenced FORTRAN subroutine representing the simulation model. Functional blocks from the DSL library (modeling analog components), from the FORTRAN library, or supplied by the user at execution time may be used to represent the elements of the model. Program features allow extensive user interaction and on-line graphics during execution. Fourth-order Runge-Kutta with automatic interval control is one of five integration methods included.

PROGRAMMING SYSTEMS - Utilizes IBM FORTRAN programming language.

MINIMUM SYSTEM REQUIREMENTS - Data input may be by card or typewriter with output on a printer, typewriter, CRT storage scope, strip-chart recorder, or 1627 X-Y Plotter. The program may be executed within the PS 44 system with 64K core. No tapes are required if a 2nd 2315 or a 2311 is available. This program was written specifically for the S/360 Model 44 and no claim is made for its operation on other S/360 computers.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D431002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTICNAL	none	none		none

360D-43.1.003
A SUBROUTINE FOR THE EVALUATION OF THE EXPOTENTIAL INTEGRAL WITH FIFTEEN SIGNIFICANT FIGURE ACCURACY

AUTHOR: J. V. Dave

DIRECT TECHNICAL INQUIRIES TO:
J. V. Dave
IBM Corporation
Scientific Center
2670 Hanover Street
Palo Alto, California 94304

*** N - - 17.4 42.0 - - - - - ***

DESCRIPTION - The purpose of this subroutine is to enable the user to obtain a value (accuracy 15 significant figures) of the exponential integral for any value of its argument in the range -170.0 to plus 173.0 using IBM System/360 and FORTRAN IV G or H language. This integral appears frequently in numerical solution of several problems in Physics (e.g., radiative transfer) where it is essential to carry out basic arithmetic with high accuracy.

PROGRAMMING SYSTEMS - FORTRAN IV is used in this program.

MINIMUM SYSTEM REQUIREMENTS - The storage required using FORTRAN IV H Language Compiler and the optimization level 0 (zero) is 3164 bytes.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D431003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-43.2.001
MIDAS - AN ADAPTATION OF THE CONVAIR PRE-COMPILING MIDAS-III DIGITAL ANALOG SIMULATION SYSTEM TO OS/360 WITH CALCOMP PLOTTING

AUTHORS: G. H. Burgin W. E. Loper

DIRECT TECHNICAL INQUIRIES TO:
W. E. Loper
Naval Weapons Center
Corona Laboratories
Computer Center
Code 05
Corona, California 91720

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*** S NOL - 03.6 11.0 16.0 17.0 - - - ***

DESCRIPTION - This MIDAS program and report are adaptations of a program (MIDAS-III) and report (GDC-DDE66-022) by G. H. Burgin of General Dynamics, Convair Division, San Diego, California. The Convair version was a continuation of developments in simulation of analog computer oriented descriptions of systems of differential equations beginning with MIDAS originally produced by Wright-Patterson Air Force Base and MIDAS-II by North American Aviation. The Convair version was a contribution to the 7094 literature in that it was a pre-compiler in contrast to the previous interpreters which were an order of magnitude slower in execution. This program and its supporting documentation modify only that which is necessary to accommodate specific differences in computers, operating systems, and peripheral equipment differences between NWCCL and Convair.

PROGRAMMING SYSTEMS - Runs under Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - S/360 Model 50, Operating System configuration.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D432001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360D-43.2.002 *N
INTEGRAL EQUATION ALGORITHM FOR THE FORWARD PROBLEM OF ELECTROCARDIOLOGY

AUTHORS: D.E. Richards A.C. Barnard
M.S. Lynn D. Vanrooy
W.P. Timlake R.H. Crane

DIRECT TECHNICAL INQUIRIES TO:
Peder Svendson
IBM Corporation
Houston Scientific Centre
6900 Fannin
Houston, Texas 77025

*** N - - - - - - - - - ***

DESCRIPTION - This is a program which obtains a numerical approximation to the solution of the forward problem of Electrocardiography, that is, it determines the steady-state potential distribution over the interfaces of an electrically inhomogeneous, volume conductor due to an interiorly located dipolar source. The numerical techniques used in solving the integral equations o are also relevant to other problems and thus many of the subroutines in the program have wider application.

PROGRAMMING SYSTEMS - Written in FORTRAN under Operating System/360.

MINIMUM SYSTEM REQUIREMENTS - System/360, Model 50 H.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D432002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360D-45.1.001 *M
INVRSOL

AUTHOR: H.R. Hamilton

DIRECT TECHNICAL INQUIRIES TO:
H.R. Hamilton
Computing Center
Box 5445 N.C. State University
Raleigh, North Carolina 27607

*** S NCS - 45.3 45.4 - - - - - ***

DESCRIPTION - A program to compute matrix inverses, solve systems of non-homogeneous linear equations and compute determinants of matrices. Output to a user specified file may be optionally obtained. Gauss-Jordan elimination with full pivoting and virtual zero tests is used.

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PROGRAMMING SYSTEMS - Written in PL/I; operates under OS.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 with the OS/360 PL/I (version 4 or higher), and a problem partition of at least 44K, can be used. The size of the matrix allowed is a function of available memory, but is approximately order - 80 for 100K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D451001

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-45.2.001 *N
EIGENRS

AUTHOR: H. R. Hamilton

DIRECT TECHNICAL INQUIRIES TO:
H. R. Hamilton
Computing Center
Box 5445, N.C. State University
Raleigh, N.C. 27607

*** S NCS - - - - - - - - - ***

DESCRIPTION - A program to compute the proper roots and vectors of real, symmetric matrices according to the symmetric Q-R algorithm. Output into a user specified file may be optionally obtained.

PROGRAMMING SYSTEMS - Written in PL/I and uses OS/360.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 computer with the OS/360 PL/I (Version 4 or higher), and a problem partition of at least 44K, can be used. The size of the matrix allowed is a function of available memory, but is approximately order - 40 for 100K.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up on Microfiche only.
MACHINE READABLE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D452001

Indicate "B N 1" in columns 1-3 and the Program Number in columns 4-13 on the IBM Program Order Form.

360D-99.0.002
NARGS - NUMBER OF ARGUMENTS

AUTHOR: Mr. P. Wolfgang

DIRECT TECHNICAL INQUIRIES TO:
Mr. P. A. T. Wolfgang
University of Pennsylvania
Computer Center
3401 Market Street
Philadelphia Pa. 19104

*** S CUP NARG - - - - - - - - ***

DESCRIPTION - NARGS is a program to determine the number of arguments supplied to a subroutine of function. It assumes the standard OS/360 calling linkage. It should not be called from a main program. The value of dummy is ignored on entry and set equal to the value of the function. NARGS may therefore be called as a subroutine.

PROGRAMMING SYSTEMS - Written in Assembly Language and requires OS/360.

MINIMUM SYSTEM REQUIREMENTS - Those required for OS/360.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D990002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-99.0.003
PROGRAM MANGEMENT WITH THE PROPER TECHNIQUE

AUTHOR: L. M. Kuyrkendall

DIRECT TECHNICAL INQUIRIES TO:
L. M. Kuyrkendall
IBM Corporation
2145 Highland Avenue, South
Birmingham, Ala. 35205

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DESCRIPTION - This is a S/360 program to assist the installation manager in maintaining a current programming schedule. By assigning a degree of difficulty to each program, scheduled completion dates are generated for writing and testing the program. The percentage of completion is also shown. Totals by programmer and by application are accumulated in three catagories - Completed, in process, and unstarted.

PROGRAMMING SYSTEMS - Programming language - COBOL. Operating system required - DOS.

MINIMUM SYSTEM REQUIREMENTS - Model 30 with 1052 Console, 32K, Decimal Arithmetic, one 2311, one card reader and one printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Appropriate material delivered.

ORDERING INFORMATION: PROGRAM NUMBER 360D990003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360D-99.0.004
/360 DOS INDIVIDUALIZED HOMEWORD ASSIGNMENT AND QUIZ GENERATOR (QUIZ AND EXERCISE DEMONSTRATER:QED)

AUTHOR: G. G. Heller

DIRECT TECHNICAL INQUIRIES TO:
G. G. Heller
IBM Education Center - Bldg. 005-2
Education Research Dept. - 914
Poughkeepsie, New York 12602

*** N - - 30.1 17.6 22.3 - - - - ***

DESCRIPTION - QED is a FORTRAN program designed to demonstrate an instructional application every schoolteacher can use immediately. When used for production runs, QED can create instant broadbased computer utilization by the entire faculty. The program generates and prints individually unique assignments or quizzes. It reinitializes itself, and continues on to print, for the teachers, a key for each assignment or quiz just produced. QED has been experimentally tested in a secondary school environment and good results were obtained with both short answer and multiple choice type questions. This is the System/360 Disk Operating System (DOS) production run version of an 1130 demonstration program.

PROGRAMMING SYSTEMS - Written in F Level FORTRAN, it has the system requirements of a standard DOS system.

MINIMUM SYSTEM REQUIREMENTS - In addition to a CPU (e.g. 2040) and at least one 2311 Disk Storage Drive (depending on the DOS version in use), the program uses the card reader part of a 2540 Card Reader - Punch and a 1403 Printer. For data preparation, an 029 Keypunch is required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D990004

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360D-99.0.008 *N
LIBRARY CIRCULATION CONTROL SYSTEM

AUTHOR: L. Gulliford

DIRECT TECHNICAL INQUIRIES TO:
L. Gulliford
Bowling Green State University
Bowling Green, Ohio 43402

*** G - - - - - - - - - ***

DESCRIPTION - The Library Circulation Control System provides the library with a list of outstanding books including missing, binding, reserve and other categories. The system produces overdue notices, name and address lists, quarterly Hold Grade Reports and faculty notices. Card input from the library originates on 3 IBM 357 Data

CONTINUED FROM PRIOR PAGE

Collection Systems. The programs dealing with name and address files will have to be changed or rewritten to suit the particular installation. Such modification should not be difficult.

PROGRAMMING SYSTEMS - Runs under OS Version 15 and 16, PCP or MFT II and is written in PL/1.

MINIMUM SYSTEM REQUIREMENTS - 75K core is required for the largest of 10 programs. To run all programs as written, 2 magnetic tape drives and 5 - 2314 Disk Drives are required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360D990003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360E-03.6.003 *N

IBM S/360 EXPANDED CARD EDITING PROGRAM

AUTHOR: L.H. Vaughan

DIRECT TECHNICAL INQUIRIES TO:
L.H. Vaughan
69 Margaret Road
Newton, Mass. 02161

*** N XCEPA - 00.0 06.6 - - - - - ***

DESCRIPTION - The Expanded Card Editing Program (XCEP) is a high performance card manipulating utility designed to provide a convenient method for rapidly and economically editing small to medium size card files. Included among the major facilities of XCEP are: 1) Three distinct card editing formats providing extensive flexibility in the selection of data. Each format fully supports the following functions: a) Reproducing: Any input fields to any output fields b) Emitting: Constant information may be inserted in any output fields; c) Interspersed Master Card Gangpunching: Any input master card fields to any output detail card fields; d) Byte Manipulation: Alteration or zone and numeric portions of bytes by constant zone-numeric data strings; transfer of zone and numeric portions of input data to output data. The number of tests which may be performed to identify the various master and detail card bytes is limited only by the available main storage. At least 40 tests can be performed in the minimum memory requirement of 10K bytes.

II. Two distinct numbering and two distinct counting routines which may be activated or de-activated for any of six different card types. The number routines provide output in binary fixed point, or zoned or packed decimal. Any signed or unsigned starting value and increment may be used. The number routines also include a special increment feature designed to facilitate the numbering of master cards followed by a variable number of detail cards. The count routines may use constant count values or read interspersed count control cards; the count routines also offer independent numbering capabilities similar to those found in the numbering routines.

III. Three distinct card verification routines permitting data validation. Extended byte manipulation and translation facilities have also been incorporated into XCEP in addition to expanded control functions.

IV. Optional listing facilities and additional control functions have been included.

IV. Optional listing facilities and additional control functions have been included.

V. The various functions may be used in any combination. XCEP utilizes a highly efficient table lookup technique to perform most functions, thus obviating the need to optimize control card input. Since the entire generating program is always resident in core storage, multiple XCEP jobs may be loaded and executed.

PROGRAMMING SYSTEMS - XCEP was written in System/360 Basic Assembler language and will run under BPS/BOS/TOS/DOS control.

MINIMUM SYSTEM REQUIREMENTS - 16K core storage (XCEP as supplied used approximately 10K bytes but may be expanded as described in the following section); Standard Instruction Set; one 1403, 1404, or 1443 for diagnostics and optional listings; one 1442, 2051, 2520, or 2540 for card input; one 1442, 2520, or 2540 for card output. The card input device must be distinct from the card output device.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360E036003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360E-15.0.003 *M

A SYSTEM/360 JOB ACCOUNTING AND SCHEDULING AIDS PACKAGE TO RECORD, EVALUATE, AND CONTROL TIME (PREACT)

AUTHORS: A.A. Gallery J. Paulsen
B. Zych M. L. Windle
J. Adler

DIRECT TECHNICAL INQUIRIES TO:
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IBM Corporation
10 So. Riverside Plaza
Chicago, Illinois 60606

*** N - - - - - - - - - ***

DESCRIPTION - This package is a collection of programs that record, evaluate, and control time. Three programmed steps account for computer time, calculate utilization, analyze operations by shift and provide data on job performance for scheduling purposes. The daily usage log similarly illustrated in the S360/20 users guide is the source document for all the programs. Date, job ID, department, use type, operator, clock time, meter time, input volume, and sequence performed are recorded. The first step edits the data for accuracy. The second calculates utilization according to job classification such as production, reruns, testing, idle time, etc., within the users own shift periods. A third program step times completed jobs giving average job time per unit of input volume. A computer scheduling form is included. These programs are specifically designed to aid in the effective use of available computer time.

PROGRAMMING SYSTEMS - The basic program material is in RPG source form. It can be run under any S/360 programming system supporting RPG.

MINIMUM SYSTEM REQUIREMENTS - 8K for card Model 20, 12K for tape or disk Model 20, 16K for BOS-TOS-DOS. I/O requirements are one card reader, one card punch, and one printer (100 print positions).

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360E150003

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360E-23.3.001

S/360 SFOAM-STRUCTURE FILE ORGANIZATION AND MAINTENANCE

AUTHOR: W. G. Olsen, Jr.

DIRECT TECHNICAL INQUIRIES TO:
W. G. Olsen, Jr.
IBM Corp.
6900 Fannin
Houston, Texas 77025

*** N - V2M0 25.1 25.3 23.1 - - - - ***

DESCRIPTION - S/360 Bill of Material Processor is a set of programs to create an index sequential product master file; create and maintain a direct access product structure chain file; perform six basic retrievals. The programs have all the features of the 1440 version (1440-ME-02X) plus- optional reverse where used chaining to speed maintenance; single input assembly delete; elimination of product structure reorganization following a product master file reorganization; coded retrieval programs.

PROGRAMMING SYSTEMS - Written in Basic Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Any S/360 disk configuration with card reader and printer. A 1052 Keyboard is required for BOS/DOS. CPU size - 12K for Mod. 20, 16K for BOS/DOS.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360E233001

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	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 9/800	28	none
		DTR 9/1600	29	none
		DTR 7DC/800	26	none
OPTIONAL	none	none		none

360L-03.2.001 *N
BUFF 40

AUTHOR: J. Hale

DIRECT TECHNICAL INQUIRIES TO:
Carol Hellriegel
698 Delaware Ave.
Buffalo, New York 14209

*** N - - - - - - - - - - ***

DESCRIPTION - The BUFF 40 FORTRAN Compiler is a core-resident program that runs as a problem program under control of Disk Operating System/360. For batch compilations, the compiler is loaded from systems residence only once and is maintained in-core for a contiguous set of compilations or jobs. This saves batch compilation overhead associated with program fetching, device allocation, job scheduling, etc. The FORTRAN Library is maintained in-core (except for seldomly used relocatable subprograms) and can be called by the FORTRAN object programs. This library includes subprograms for logarithmic, exponential, trignometric and other mathematical functions.

The compiler translates programs written in BUFF 40 language into core resident, core image programs. A source listing along with error indications and a storage map of the variables, external references, and constants is produced on request. Linkage editing is not required. No object deck is produced. A compile time option is provided which will allow the introduction of source programs in either BCD or EBCDIC character codes. The output of the compiler - source listings and literal data in object programs - will utilize the original, untranslated character codes. At object time, literals, A-format and H-format input and output data will not be translated; D-, E-, F-, and I-format input data may be either BCD or EBCDIC code representation.

PROGRAMMING SYSTEMS - Written in DOS Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - Currently designed to compile source decks up to 300-400 cards in 64K, it requires no external storage for intermediate work files for compile or compile and go requests. Although designed to operate in 64K bytes of main storage, the compiler will effectively use more if available.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L032001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-04.4.001 *N
1827 CONTROL PROGRAM

AUTHOR: J.M. Hutchinson

DIRECT TECHNICAL INQUIRIES TO:
J.M. Hutchinson
IBM Corporation
2901 Peralta Oaks Court
Oakland, California 94605

*** N - - 02.0 - - - - - - ***

DESCRIPTION - This program performs analog and digital I/O on an 1827 Data Control Unit as requested through the console typewriter. The user enters the type of I/O operation, the point address, and the data in the case of output operation. The program then performs the operation and then types out the data in the case of input operations. This program can be especially helpful in testing a user's hardware connections and performing simple process I/O.

PROGRAMMING SYSTEMS - Written in a (Model 44) subset of S/360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - A System/360, Model 25 and up, equipped with a 1052 Console Typewriter, 2540 Card Read/Punch, and the appropriate 1827 devices (the comparator is not supported).

CONTINUED FROM PRIOR COLUMN

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code.

ORDERING INFORMATION: PROGRAM NUMBER 360L044001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	DTR*	00	none

360I-05.0.001 *N
2260 SUPPORT FOR MISP

AUTHOR: Henrique Drews

DIRECT TECHNICAL INQUIRIES TO:
Henrique Drews
Garden State Parkway, Exit 136
Cranford, New Jersey 07043

*** N - - 03.4 - - - - - - ***

DESCRIPTION - The 2260 Support for MISP consists of a version of the line control programs that include device support for 2260 Display Units. These programs permit the use of the display units within a system running under MISP. Additional facilities are included for the Application Programs to use the displays effectively. Both local and remote 2260 are supported. Translation and queueing of input and output are provided. These programs replace the line control modules in MISP 1-1 and include all updates as of January 1970.

PROGRAMMING SYSTEMS - The programs, an extension of the original programs in MISP, are written in Assembler Language and are designed to be incorporated directly into a MISP system.

MINIMUM SYSTEM REQUIREMENTS - Same as those required for DOS/360 and MISP.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L050001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-05.1.001 *N
ONLINE/OS - A CONVERSATIONAL MONITOR FOR OS/360

AUTHOR: C.I. Johnson

DIRECT TECHNICAL INQUIRIES TO:
C.I. Johnson
IBM Cambridge Scientific Center
545 Technology Square
Cambridge, Mass. 02139

*** N IBM - 01.6 03.1 03.2 03.6 - - - ***

DESCRIPTION - The ONLINE/OS conversational partition monitor provides terminal-based interactive function within OS/360 PCP and MFT. With minor modifications ONLINE/OS could run within OS/360 MVT. It provides to the systems-or application-programmer, or user the ability to create, compile, load, execute and debug programs within a PCP system or a partition of OS/360 MFT, from an interactive terminal. Facilities are provided to allow dynamic access to the user's source, object, load module, listing and data files. An important feature is the provision of a facility for recovery from errors in a fashion which allows the terminal user to remain in control of the system after the abnormal termination (ABEND) of his program. Thus he may easily reinitiate the program from the terminal in order to continue debugging or he may choose to perform some other function to correct the error observed.

PROGRAMMING SYSTEMS - Written in the OS/360 Assembler F language.

MINIMUM SYSTEM REQUIREMENTS - 256K byte memory, 1403 and a 2314 Drive.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

CONTINUED FROM PRIOR PAGE

ORDERING INFORMATION: PROGRAM NUMBER 360L051001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360L-06.7.001 *N

INFORMATION RETRIEVAL MANAGEMENT SYSTEM (IRMS)

AUTHOR: F. Guedenay

DIRECT TECHNICAL INQUIRIES TO:
S.E. Furth, Manager-Information Systems Mkt.
IBM Corporation
112 East Post Road
White Plains, New York 10601

*** N - - - - - - - - - ***

DESCRIPTION - The IRMS program is designed to provide users with an efficient document retrieval system. It also can be used for Selective Dissemination of Information (SDI). IRMS consists of seven programs of which three are for thesaurus file creation and maintenance, three for file management of the document file, statistical file and bibliographic file.

IRMS assumes the existence of a thesaurus file, an inverted file, a bibliographic file and a request which may be either an SDI profile or query.

PROGRAMMING SYSTEMS - IRMS is written in System/360 Assembly language and runs under DOS.

MINIMUM SYSTEM REQUIREMENTS - The program requires 22K bytes of storage for IRMS resident programs, the largest of which is the Search Program. The minimum configuration required is a S/360 Model 25 or 30 with 32K bytes of main storage. In addition to DOS secondary storage a minimum of two 2311 Disk Storage Drives in necessary.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code and sample problem.

OPTIONAL PROGRAM PACKAGE
DOCUMENTATION - None.
MACHINE READABLE - Source code and flowcharts.

ORDERING INFORMATION: PROGRAM NUMBER 360L067001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none

360L-13.0.001 *N

SASE IV - AN IMPROVED PROGRAM FOR THE STATISTICAL ANALYSIS OF SERIES OF EVENTS

AUTHORS: P.A.W. Lewis
A.M. Katcher
A.H. Weis

DIRECT TECHNICAL INQUIRIES TO:
A.M. Katcher
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

*** N - - 13.4 13.6 - - - - - ***

DESCRIPTION - The SASE IV Program implements the methodology for the statistical analysis of series of events given in a book of that title by DR. D. R. Cox and P. A. W. Lewis.

PROGRAMMING SYSTEMS - The Program is written in FORTRAN IV and has been compiled and tested using OS Version 14 on a S/360 Model 50, Model 91.

MINIMUM SYSTEM REQUIREMENTS - A System/360 Model 50 with 512 bytes of core storage, printer, card reader and one tape unit. The plotting referred to in the text is done on the printer.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L130001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

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360L-15.0.001 *N

DZLP - ADAPTIVE BINARY PROGRAMMING

AUTHORS: H.M. Salkin K. Spielberg

DIRECT TECHNICAL INQUIRIES TO:
K. Spielberg
IBM New York Scientific Center
410 E. 62nd Street
New York, New York 10021

*** N - - 15.2 - - - - - - ***

DESCRIPTION - DZLP is intended to solve minimization problems of the linear programming type, subject to the additional constraints that all the variables must take the value 0 or 1 only. The basic approach is zero-one search coupled with a dynamic origin technique developed by the authors. The method is more flexible and tends to be more efficient than the well known fixed origin techniques. Problems ranging from 12 to 50 variables, with as many as 31 rows were solved in less than one minute on an IBM 360 Model 50 computer. The program is set up to treat problems with a maximum of 150 variables and 50 constraints. However, it can easily be modified to accommodate larger problems by simple changes in dimension statements.

PROGRAMMING SYSTEMS - The code is written entirely in FORTRAN G compiler.

MINIMUM SYSTEM REQUIREMENTS - It requires 226K bytes of core for the GO step and 324K bytes of core for the job REGION area. Input is on cards and output on paper.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L150001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360L-16.3.001 *N

IBM 360 DYE SELECTION AND FORMULATION PROGRAM FOR COLOR MATCHING

AUTHORS: Dr. C.S. Ellis E.L. Stutz
D.R. White

DIRECT TECHNICAL INQUIRIES TO:
Dr. C.S. Ellis
IBM Corporation
P.O. Box 207
Greenville, S.C. 29602

*** N - - - - - - - - - ***

DESCRIPTION - This package of programs is simply an adaption of program number 1130-16.3.001, so that these IBM 1130 programs may be run on some of the IBM System/360 computers. These programs assist the dyer in determining which dye combinations and how much of each dye should be mixed together to produce a desired color. The primary input to the system is: (1) reflectance data which describes the undyed material or substrate, (2) reflectance data on the desired color or standard shade, and (3) reflectance data on the individual or primary dyes. After the colorist pre-selects a group of primary dyes to be considered as candidates, the system of programs determines all of the feasible three-dye or four-dye formulas which can be produced with this group of primaries. Two-dye and one-dye formulas may also be found. The total dye formula cost and certain technical quality parameters are printed with each formula. Unless the pre-selected group of primaries is too small, a number of alternate matching formulas will be found and these are printed out in ascending cost sequence. Thus, this system enables the colorist to compare the predicted quality and cost of many alternate matching formulas; one or more dye formulas can then be selected before making trial dyeings in the laboratory. It is not at all uncommon to find perfectly satisfactory dye formulas that are less than half as expensive as were found previously when only manual procedures or analog computers were used. Two different dye formula correction routines are included. The first is based on theory and works sometimes. The second is an empirical method which nearly always works. In the opinion of the authors, the IBM 1130 or the IBM 1800 are better hardware choices for color matching computations than the System 360/25, 360/30,.....This is because a typical color matching job is virtually always compute

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bound; thus the faster but more expensive Input/Output devices available on System 360 result in only slight reductions in the total processing time.

PROGRAMMING SYSTEMS - The source programs were written in basic FORTRAN IV. These programs were tested under DOS release 20. The prospective user is advised that difficulties may be encountered if he attempts to use a different release of DOS.

MINIMUM SYSTEM REQUIREMENTS - At least a 360/25 with 32K core, Floating Point Hardware, and at least one disk.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L163001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360L-17.4.001 *N
CALGARY SEISMIC SYSTEM

AUTHOR: Jack R. Sisko

DIRECT TECHNICAL INQUIRIES TO:
Jack R. Sisko
WTC Pet. Exploration and Prod. Industry Ctr.
606 Fourth Street South West
Calgary 2, Alberta, Canada

*** N - - 13.4 16.6 - - - - - ***

DESCRIPTION - The Calgary Seismic System comprises a set of programs to demonstrate the processing of digital seismic reflection data recorded for petroleum exploration. Flexibility in choosing the processing sequence of system or additional user programs is provided. The programs perform such functions as static and dynamic corrections, trace gather, stack, deconvolution, and filtering of trace sequential data. Utility routines are provided to facilitate data organization and checking. Input/Output is handled by a set of separately documented subroutines providing access to the data from user-written high-level language programs.

PROGRAMMING SYSTEM - The programs are DOS/360 Assembler Language with some FORTRAN H modules designed under the Disk Operating System.

MINIMUM SYSTEM REQUIREMENTS - The required S/360 machine configuration is 256K with Decimal and Floating Point Instruction Sets. 3-2311 Disk Drives or equivalent, 3-2400 Tape Units, a card-read-punch and a printer. Support is provided for the 2937 Multiplier-Summation Processor, although this device is not required.

A separate version of these programs is provided to operate under OS/360. Input/output routines are re-written and optional support for the IBM 2938 Array Processor are provided; the functional capabilities are equivalent to the DOS version.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Appropriate material delivered.
DOS users specify program number extension "OPT1"...
OS users specify program number extension "OPT2".

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L174001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	OPT1	MT 9/800	28	01
		MT 9/1600	29	01
	OPT2	MT 7DC/800	26	01
		MT 9/800	28	01
		MT 9/1600	29	01
OPTIONAL	none	none		none

360L-19.0.001 *N
BROKERAGE COMMUNICATIONS CONTROL APPLICATION PROGRAM

AUTHOR: R.L. Tunstall

DIRECT TECHNICAL INQUIRIES TO:
R.L. Tunstall
IBM Corporation
4 New York Plaza
New York, New York 10004

*** N - - - - - - - - - ***

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DESCRIPTION - Brokerage CCAP (BCCAP) is a highly modified and expanded version of basic CCAP an IBM Type II message switching program. It performs the functions of message anlaysis, editing and routing for brokerage orders, executions and administrative traffic. The program consists of several mainline program, overlays and system utility programs to perform the brokerage switching job.

PROGRAMMING SYSTEMS - BCCAP is a stand-alone, multi-programming system having its own supervisor, schedulers and IOCS. It is written in 360 Assembler Language.

MINIMUM SYSTEM REQUIREMENTS - BCCAP can be implemented on a 360/40, 50 or 65. Minimum core requirements are 128K and are a function of the size of the communication network, 2311 or 2314 Disk Files, 2540 Card Reader/Punch, 1403 Printer and appropriate 2702/03 are also required.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L190001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-19.0.002 *N
IBM S/360 LOS ANGELES FINANCIAL ON-LINE-BANKING REFERENCE SYSTEM FOR SAVINGS

AUTHOR: J. Teagarden

DIRECT TECHNICAL INQUIRIES TO:
H. Whiteman Eileen Gaffney
IBM Corporation
2 Broadway
New York, New York 10004

*** N - - 00.7 - - - - - - - ***

DESCRIPTION - This reference system is an aid to the operation of an On-Line Banking Reference System as developed by the Los Angeles Commercial Branch Office of IBM. It supports the IBM 1060 Banking Terminal, 1050 Communications Terminal, 2740 Communications Terminal, 2260 Visual Display Terminal and the 2980 Banking Terminal. This package as supplied includes a customer Master File which may be used for demonstration and testing purposes. Supporting documentation includes general diagrams, user's manual and sample control cards. This reference system ties together the various components of the DOS which interrelates with the On-Line Program. These are ISAM, BDAM, BTAM, SAM, and EXCP.

PROGRAMMING SYSTEMS - The On-Line program was written using DOS Assembler Language under Version 3, Release 21 of DOS.

MINIMUM SYSTEM REQUIREMENTS - At least a 49K S/360 Model 25 (with Considerable streamlining of the program). The hardware features required include; decimal arithemtic, selector channel one, console attachment, interval timer, storage-protect (if multi-programming), disk control unit, disk files-as governed by ISAM conventions, unit record (card reader, card punch, and printer), transmission control unit, and a multiplexor channel.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L190002

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-23.1.001 *N
PAPER MACHINE TRIM SYSTEM

AUTHOR: E. Garrett

DIRECT TECHNICAL INQUIRIES TO:
E. Garrett
IBM Corporation
112 East Post Road
White Plains, N.Y. 10601

*** N - - - - - - - - - ***

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DESCRIPTION - This is an S/360 version of 7090 cutting stock program, PKCSS1, using the Gomory Gilmore knapsack algorithm for solving one-dimensional cutting stock problems.

PROGRAMMING SYSTEMS - The program is written in DOS FORTRAN with one BAL subroutine for handling overlays.

MINIMUM SYSTEM REQUIREMENTS - In 32K, the maximum size problem (machine plus order widths plus one) is forty-four. In 64K the maximum is ninety.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L231001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

360L-28.3.001 *N
CMS-CREDIT MANAGEMENT SYSTEM

AUTHOR: J. Dennis Newton

DIRECT TECHNICAL INQUIRIES TO:
J. Dennis Newton
IBM Corp., Branch Office 05T
500 S.W.7th Street
Renton, Washington 98055

*** N - - 06.7 08.7 30.1 - - - - ***

DESCRIPTION - The retail Credit Management System is an on-line 2260 System for use in authorizing and maintaining retail "charge" accounts. Some features are a generalized monitor capable of multitasking several jobs. The credit functions are: Authorization, account changes, create new accounts, entire account display, account notes and an activity and audit report.

PROGRAMMING SYSTEMS - Written in DOS Assembler using BTAM for local 2260 support. The master files are on a DASD device.

MINIMUM SYSTEM REQUIREMENTS - The program requires 34,000 bytes plus 1256 per terminal, so a minimum system would run on a 360/25.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L283001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-30.0.001 *N
LEGISLATIVE INFORMATION SYSTEM DEMONSTRATION PACKAGE (LEGISY)

AUTHOR: J.P. Mitchell

DIRECT TECHNICAL INQUIRIES TO:
J.P. Mitchell
IBM Corporation
11141 Georgia Avenue
Wheaton, Maryland 20902

*** N IBM - 30.1 30.2 - - - - - ***

DESCRIPTION - LEGISY is a portion of a Legislative Information System designed to respond to queries into three index sequential files which reflect the current status and disposition of bills, committees and members of the legislature during a given session.

PROGRAMMING SYSTEMS - Written in BAL, using BTAM and a Type III package known as FASTER. LEGISY operates as a S/360 DOS foreground job.

MINIMUM SYSTEM REQUIREMENTS - 64K minimum partition of storage and supports a communications network consisting of IBM 1050, 2740 Typewriter Terminals, and the IBM 2260 Display Terminal.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code, source code and sample problem.

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OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L300001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR 7DC/800	26	none
		DTR 9/800	28	none
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-50.1.001 *N
ALIS STARTER SYSTEM

AUTHOR: IBM Insurance Industry Development

DIRECT TECHNICAL INQUIRIES TO:
IBM Insurance Industry Development
380 Northwest Highway
Des Plaines, Ill. 60016

*** N - - 50.1 - - - - - - ***

DESCRIPTION - The ALIS Starter System provides the ability to process transactions through an unmodified ALIS system and examine output without generating a complete ALIS system. It is intended as a training tool for users in early stages of installing ALIS.

The Starter System consists of four files: 1. OS stand-alone DASDI and DUMP/RESTORE programs. 2. A dump of core image library generated for Version I, mod level 2, of ALIS and Release 20 of DOS. 3. Control cards and external transactions for running two cash accounting system cycles, each cycle spanning one months internal activity. 4. Policy master records.

It should be noted that the transactions and master records were developed for test purposes and, as such, are not representative of an insurance company's transaction mix or common policy type; however, the transactions and master records may be modified to suit the user's training needs. Running time for the two cycles is 3-4 hours.

PROGRAMMING SYSTEMS - Written in COBOL and Assembly Language.

MINIMUM SYSTEM REQUIREMENTS - The same as those specified for the ALIS daily cycle in the Advanced Life Information System Product Announcement.

BASIC PROGRAM PACKAGE
DOCUMENTATION - Write-up.
MACHINE READABLE - Object code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L501001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	MT 7DC/800	26	01
		MT 9/800	28	01
		DTR 9/1600	29	none
OPTIONAL	none	none		none

360L-99.0.001 *N
AUTOMATIC DRIVER RE-TEST PROGRAM S/360

AUTHORS: T.C. Douglas
A. Supplee

DIRECT TECHNICAL INQUIRIES TO:
T.C. Douglas
IBM Corporation
413 W. State Street
Trenton, New Jersey 08607

*** N - - - - - - - - - ***

DESCRIPTION - The Automatic Driver Re-Test Program is designed to administer, through the use of a 2260, either an initial driver's examination or a re-examination of a licensed driver. The test contains two parts. First, there is a test of vision which must be passed to get to the second part of the test. The second part of the test is a series of questions on traffic laws and safe vehicle operation.

Upon completion of the questions, the test is graded internally and the results are listed on the 2260 and on a 1053.

PROGRAMMING SYSTEMS - Written in Assembly Language and was run uder DOS Release 20.

MINIMUM SYSTEM REQUIREMENTS - A 2260 and a 1053 and those required to run 360/DOS.

BASIC PROGRAM PACKAGE

CONTINUED FROM PRIOR PAGE

DOCUMENTATION - Write-up.
MACHINE READABLE - Source code.

OPTIONAL PROGRAM PACKAGE - None.

ORDERING INFORMATION: PROGRAM NUMBER 360L990001

	PROGRAM NUMBER EXTENSION	DISTRIBUTION MEDIUM TYPE	CODE	USER VOLUME REQUIREMENT
BASIC	none	DTR*	00	none
OPTIONAL	none	none		none

Catalog of Programs for IBM S/360 Models 25 and above Printed in U.S.A. GC20-1619-8

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Catalog of Programs for IBM System/360
Models 25 and Above
(January 1971)

GC20-1619-8

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Date March 1971

Previous Newsletter Nos. None

CATALOG OF PROGRAMS FOR IBM SYSTEM/360 MODELS 25 and ABOVE
March 1971 Supplement

This publication is a Supplement to the *"Catalog of Program for IBM System/360 Models 25 and Above,"* GC20-1619-8

Complete instructions for using the KWIC Index and for ordering programs are included in the Catalog. Programs will not be supplied by authors and should not be requested from them.

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IBM
SYSTEM 360

The following programs have been removed from the Program Information Department at the request of the SHARE User Group. All requests for these programs should be directed to the new distribution agency for SHARE:

SHARE Program Library Agency
COSMIC
Barrow Hall
University of Georgia
Athens, Georgia 30601

360D-00.0.012	SERVICE AND UTILITY PROGRAM BY EXTERNAL REQUEST (SUPER 44)
360D-00.1.001	MULTI INPUT TIME SHARING SYSTEM (MITS)
360D-00.1.022	NYU PRINT-UTILITY PROGRAM
360D-00.2.001	BPS/DOS/TOS FORTRAN FLOWCHART PROGRAM
360D-00.4.014	CHANGE1 - OS/360 DASD EXPIRATION DATE WRITER
360D-00.6.008	IO2260 DISPLAY/ATTENTION PACKAGE
360D-00.6.011	A HYPERTEXT EDITING SYSTEM FOR THE S/360 USING THE 2250 DISPLAY
360D-01.4.003	OPERATING SYSTEM ACCOUNTING
360D-01.4.009	SUPER-SCRATCH (SUPERSCR)
360D-01.4.011	XEROX - COMMUNICATION PRODUCTS DIVISION OS/360 - MFT ACCOUNTING ROUTINES
360D-01.5.002	360/1620 TAPE TO COMPATIBILITY DISK RESTORE
360D-01.5.003	360/1620 COMPATIBILITY DISK TO TAPE DUMP
360D-01.6.005	VTOC4MAT
360D-03.0.005	ICES/360 SOURCE BASIC SYSTEM AND LANGUAGE PROCESSORS
360D-03.0.010	STENO TO ENGLISH TRANSLATION
360D-03.0.014	MULTIPROGRAMMING SYSTEM (MPS)
360D-03.1.014	FAST ASSEMBLER - INTERPRETER FOR SYSTEM/360 ASSEMBLER LANGUAGE PROGRAMS (VERSION 1)
360D-03.2.008	KINETIC SIMULATION LANGUAGE FOR CHEMISTRY AND BIOCHEMESTRY
360D-03.2.011	OS/360 PL360 COMPILER
360D-03.2.014	THE SIMSCRIPT II PROGRAMMING LANGUAGE
360D-03.2.015	THE XPL COMPILER GENERATOR SYSTEM
360D-03.3.010	SNAP PROCESSOR (PROTOTYPE)
360D-03.3.011	COMIT/360
360D-03.4.007	SUBROUTINE OBJFMT
360D-03.4.010	SUBROUTINE OBJFMT
360D-03.4.027	FORTRAN RANDOM I/O SUBROUTINE
360D-03.4.033	A 2250 MODEL 1 SIMULATION SUPPORT PACKAGE
360D-03.5.005	A SYSTEM TO PROCESS ABSTRACT CATALOGS AND RELATED INDICES
360D-03.5.007	REPORT WRITER
360D-03.6.001	FORTRAN CROSS REFERENCE
360D-03.6.007	COBOL SOURCE CROSS-REFERENCE LISTING
360D-03.6.018	NEATER: A PL/I SOURCE STATEMENT REFORMATTER
360D-03.8.006	XEROX INFORMATION SYSTEMS DIVISION ACCOUNT ROUTINE
360D-03.8.013	PL/I STRING FUNCTIONS
360D-04.0.006	CLOCK
360D-04.0.010	SIMPLIFIED INPUT - OUTPUT AND DEBUGGING MACROS FOR ASSEMBLER LANGUAGE USERS
360D-05.1.004	LINCOLN LABORATORY MULTI-PROGRAMMING SUPERVISOR (LIMPS)
360D-05.1.012	RACS/44 - REMOTE ACCESS TIME SHARING
360D-05.1.018	BAYLOR EXECUTIVE SYSTEM FOR TELEPROCESSING (BEST)
360D-05.1.020	PITT TIME SHARING SYSTEM AND ASSOCIATED LANGUAGE PROCESSORS
360D-06.3.012	HIGH SPEED BSCAM
360D-06.5.006	UNIVAC-1108 TO IBM-360 FLOATING POINT INTERNAL CONVERTER ('CVFL08')
360D-06.5.007	7090 TO 360 FLOATING POINT INTERNAL CONVERTER ('CVFL90')
360D-06.6.003	FORTRAN CHARACTER STRING PACKAGE
360D-06.6.004	CHARACTER FILTER PL/I
360D-06.7.018	BSEARCH - A RANDOM ACCESS BINARY-SEARCH TECHNIQUE FOR SEQUENTIAL FILES ON DISK OR DRUM
360D-06.7.019	KWADE - KEYWORD AS A DICTIONARY ENTRY
360D-06.7.022	OS/360 QUIC (KWIC INDEXING)
360D-06.8.002	LPI
360D-06.8.003	THE DATA STRUCTURES PROGRAMMING SYSTEM
360D-08.0.003	WRIMAT MATRIX WRITER
360D-08.6.001	PLOTS - A SUBROUTINE FOR THE TIME-SERIES PLOTTING ON A PRINTER
360D-08.6.003	PLOT - A SUBROUTINE FOR PLOTTING ON A PRINTER
360D-08.6.005	IBM 1780 (GEOSPACE) PLOTTER SUBROUTINE FOR OS/360
360D-08.6.011	PNRG, PERSPECTIVE PLOTTING ROUTINE, ARBITRARY GRID
360D-08.6.012	PRG, PERSPECTIVE PLOTTING ROUTINE, RECTANGULAR GRID
360D-08.6.013	PLT360, IBM 1627 PLOTTING ROUTINE
360D-08.7.003	HISTOGRAM DISPLAY SUBROUTINE
360D-08.7.004	INTERSECTION DETECTION IN THREE DIMENSIONS - A TOOL FOR COMPUTER AIDED ENGINEERING DESIGN AND GRAPHICS DISPLAY
360D-08.7.006	SPLOT - ONE PAGE GRAPH-PRINTING SUBROUTINE
360D-11.4.002	DCALC
360D-12.0.003	SIFT BCD CODES TO EBC AND DIAGNOSE FORTRAN IV CONVERSION PROBLEMS UNDER OS/360
360D-12.0.004	SIFT BCD CODES TO EBC AND DIAGNOSE FORTRAN IV CONVERSION PROBLEMS UNDER BOS/360
360D-12.1.013	360/1620 DATA DISK GENERATION FROM 1401 7-TRACK TAPE
360D-12.1.014	TIRNKL - CONVERT PREST DECKS TO BCD FORMAT
360D-12.2.002	FORTRAN IV TO PL/I TRANSLATOR
360D-13.0.009	HISTOGRAM SUBROUTINE
360D-13.2.003	LEAST-SQUARES ESTIMATION OF NON LINEAR -LINEAR PARAMETERS-NLIN
360D-13.4.001	COOLEY-TUKEY FAST FOURIER TRANSFORM
360D-13.4.002	COOLEY-TUKEY FAST FOURIER TRANSFORM

360D-13.4.007	RESCALED RANGE TRANSFORM
360D-13.6.003	NONLINEAR PARAMTER ESTIMATION AND PROGRAMMING
360D-13.6.007	NON-LINEAR LEAST SQUARES CURVE FITTING PROGRAM
360D-13.6.008	LINEAR LEAST-SQUARES CURVE FITTING PROGRAM
360D-13.7.001	DIALL - GENERAL LEAST SQUARES DIALLEL ANALYSIS OF VARIANCE
360D-15.1.004	360 GASP III - GENERALIZED ACADEMIC SIMULATION PROGRAM
360D-15.2.007	MFOR 360 LINEAR PROGRAMMING CODE
360D-15.2.011	ZERO-ONE INTEGER PROGRAMMING WITH HEURISTICS
360D-15.3.002	QPS: A QUADRATIC PROGRAMMING SYSTEM FOR THE IBM/360
360D-15.4.004	ICES/360 PROJECT-I
360D-15.4.006	ICES/360 SOURCE PROJECT - I
360D-16.0.001	UCARDS: UNION CARBIDE AUTOMATIC ROUTING AND DESIGN FOR PRINTED CIRCUIT BOARDS
360D-16.1.001	ROCKET - FORTRAN 4 VERSION
360D-16.2.005	ICES/360 BASIC SYSTEM AND LANGUAGE PROCESSORS
360D-16.2.006	ICES/360 COGO I
360D-16.2.007	ICES/360 STRUDL-I
360D-16.2.008	ICES/360 TABLE-I
360D-16.2.009	ICES/360 SEPOL-I
360D-16.2.010	ICES/360 ROADS-I
360D-16.2.011	ICES/360 TRANSET-I
360D-16.2.012	ICES/360 EDUCATIONAL COGO-I
360D-16.2.013	ICES/360 BRIDGE I DESIGN SYSTEM
360D-16.2.014	ICES/360 SOURCE TABLE I
360D-16.2.015	ICES/360 SOURCE STRUDL-I
360D-16.2.017	ICES/360 OPTECH I
360D-16.2.019	ICES/360 STRUDL-II
360D-16.2.021	ICES/360 SOURCE TRANSET I
360D-16.2.023	ICES/360 COGO-I SOURCE
360D-16.2.024	ICES/360 ROADS I SOURCE
360D-16.2.025	ICES/360 TABLE-II, OBJECT AND SOURCE
360D-16.2.026	ICES/LEAST-I
360D-16.2.027	ICES/360 SOURCE STRUDL-II
360D-16.2.028	ICES/360 STRUDL - II - CSAS16
360D-16.3.002	PULSE TESTING VIA THE FAST FOURIER TRANSFORM
360D-17.1.001	QUANTITATIVE ANALYSIS WITH ELECTRON MICROPROBE ANALYZER
360D-17.2.006	CERN SUMX - A DATA SUMMARIZATION PROGRAM FOR THE IBM/360
360D-17.2.009	ON-LINE SUMX
360D-17.5.001	360 BIOLOGICAL REFLEX ANALYTICAL PROGRAM
360D-17.7.001	SUBROUTINE UCONIC
360D-23.1.003	TWO-STAGE, TWO-DIMENSIONAL TRIM PROGRAM II
360D-40.0.001	DFACT - DOUBLE PRECISION FACTORIAL
360D-40.4.001	GETEXP AND SETEXP
360D-40.4.003	MULTIPLE - PRECISION FLOATING-POINT ARITHMETIC PACKAGE
360D-42.2.001	EXPERIMENTAL PROGRAM FOR DETERMINING POLYNOMIAL ZEROS
360D-43.1.001	ANL D153S DROMB TWO-DIMENSIONAL ROMBERG QUADRATURE
360D-43.2.001	MIDAS - AN ADAPTATION OF THE CONVAIR PRE-COMPILING MIDAS-III DIGITAL ANALOG SIMULATION SYSTEM TO OS/360 WITH CALCOMP PLOTTING
360D-45.1.001	INVRSOL
360D-45.2.001	EIGENRS
360D-99.0.002	NARGS - NUMBER OF ARGUMENTS

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This publication is a Supplement to the *"Catalog of Programs for IBM System/360 Models 25 and Above,"* GC20-1619-8.

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PLANNED DELETIONS

The following list of Type III Contributed Programs will be withdrawn by the Program Information Department on June 30, 1972. Until that date, orders for these Programs will be accepted by PID.

PROGRAM NO.	PROGRAM NAME
360D-00.5.001	Initialize Data Cell Strip
360D-00.6.001	Data Set Editing with a Graphic Device
360D-00.6.002	Graphic Display of Data Sets Using OS/360
360D-00.6.004	Alphanumeric Display Package for the IBM 2250
360D-00.6.007	GDUMP - Translation of 2250 Graphic Data Using OS/360
360D-02.5.001	Dynamic Status Recorder System Edit and Print Model 30
360D-02.5.002	Dynamic Status Recorder System Edit and Print Model 40
360D-02.5.004	Dynamic Status Recording for DOS Version II with System Edit Print and Initialize Models 30, 40, 50
360D-03.2.013	Basic Compiler Under TSS/360
360D-03.3.005	IBM 1440 Object Deck Simulator on IBM 1401 or System/360
360D-03.3.007	APL/360
360D-03.7.023	A DOS Graphic Programming Services Package for the 2250
360D-03.7.025	Carrier Return, Line Feed on the 1052/53 MISLCRLF
360D-04.2.001	8K Trace for IBM System/360
360D-04.3.002	Advanced Life Information System Master Record Utility Program
360D-04.4.005	GBUB - A Graphic Tool for On-Line Program Debugging
360D-05.1.001	Remote Access Computing System
360D-05.1.008	Multi-Compatibility Control (MCC-II) for 1401 Compatibility on System/360 Model 30
360D-05.1.009	Model 40 1401 Emulator and DOS in Stacked Job Environment
360D-05.2.004	Extra Large Compatibility Initialization Deck EL-CID
360D-05.2.008	Double 7074 Emulation on 360-65-I
360D-05.2.010	Interactive Applications Supervisor (IAS/360)
360D-06.4.002	1092/93 Keymat Decoding with Medical Information System
360D-06.6.002	Byte/Bit MAP - A Macro for Programs Receiving Data from 1092 Keyboard Terminals
360D-08.7.001	Graphic FORTRAN System for the IBM 2250 Display Unit
360D-11.1.001	Burroughs B280 Simulator Program
360D-11.1.023	Disk Residence for 1410 Compatibility Mode Programs On the IBM S/360 Model 40
360D-11.2.002	DOS/MICR Simulator
360D-11.4.001	A Simulator Program Implementing the NOBIS Educational Computer Design
360D-12.1.011	OS FORTRAN IV Subroutines for Reading and Converting Binary Tapes Generated by a 7094
360D-12.1.017	UNIVAC 490 Series - S/360 Data Tape Converter
360D-17.2.005	SUMX - A Data Summarization Program for the IBM/360
360D-25.0.004	Equipment Order, Shipment, Installation, and Discontinuance Report for Large Accounts
360D-29.4.003	Administrative Terminal System Offline Format and Print Program - OLPRT/360
360D-30.2.001	System/360 1030 Data Collection System Demonstration System

PLANNED DELETIONS

360D-43.1.003	A Subroutine for the Evaluation of the Expotential Integral with Fifteen Significant Figure Accuracy
360D-43.2.002	Integral Equation Algorithm for the Forward Problem of Electrocardiology

The following list of Type IV Contributed Programs will be retired by the Program Information Department on June 30, 1972. Unitl that date, orders for these programs will be accepted by PID. After that date, only the documentation associated with these programs, recorded on microfiche cards, will be available from PID.

PROGRAM NO.	PROGRAM NAME
360D-00.3.027	Seven Track Octal Tape Dump
360D-03.2.009	Modified DOS FORTRAN Compiler
360D-04.6.001	A Program for Graphic On-Line Debugging on an IBM 2250 Display
360D-05.1.019	O.S./M.I.S.P. Version 1.1
360D-06.1.005	MARC II Sort Program
360D-06.3.013	1907 Remote Entry Program
360D-16.2.018	Bulkhead Sheet Piling Analysis
360D-19.3.001	Sales/Assessment Ration Analysis Program
360D-23.3.006	Bill Processor Interface Macro and Chase Subroutine for Use with PL/I-Subset Retrieval Programs

The following list of Prior Use Programs will be withdrawn by the Program Information Department on June 30, 1972. Until, that date, orders for these programs will be accepted by PID.

PROGRAM NO.	PROGRAM NAME
360L-17.4.001	Calgary Seismic System

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